DOCUMENT RESUME

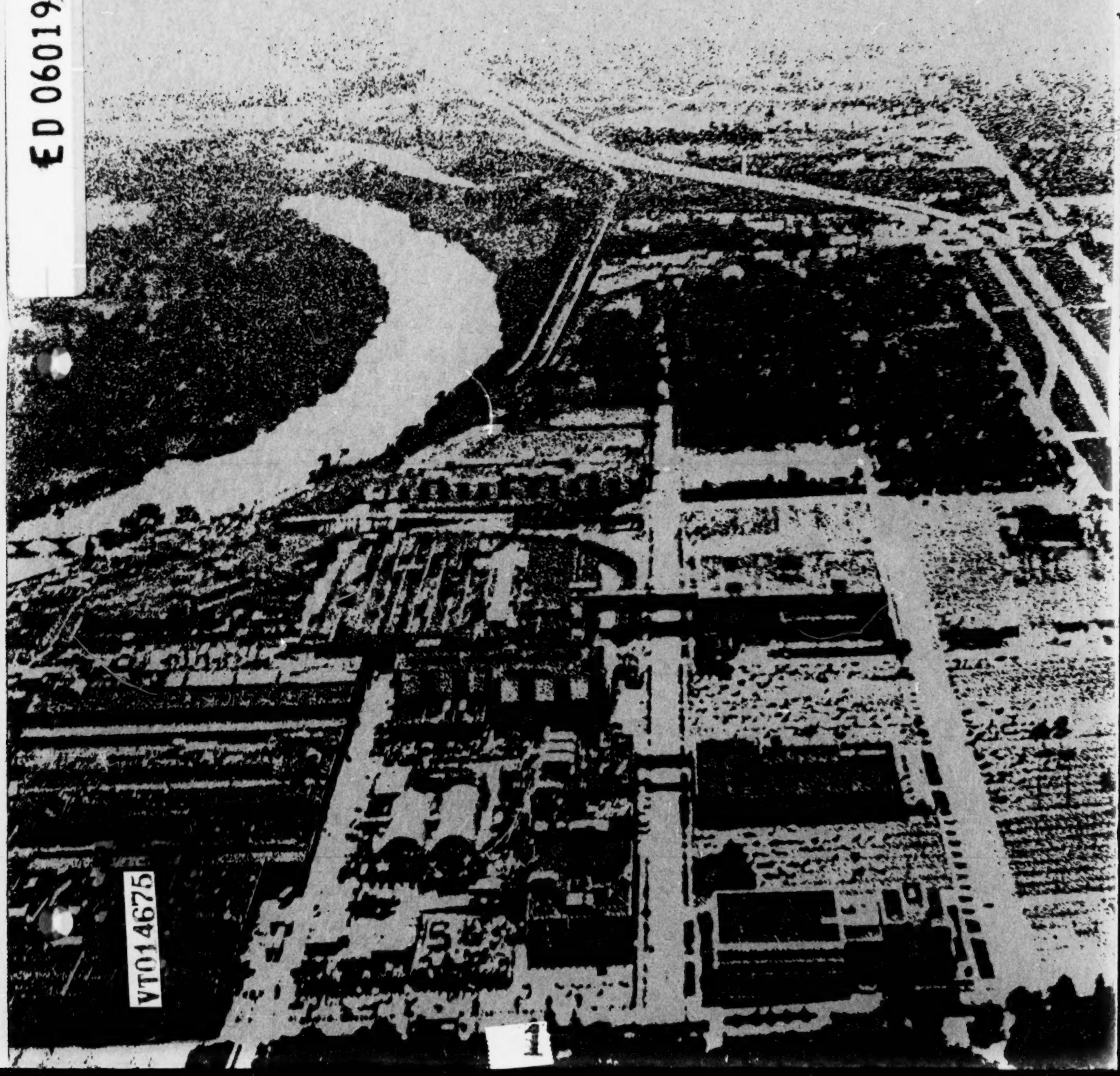
ED 060 192 VT 014 675

AUTHOR	Ferns, George W.
TITLE	Michigan's Vocational-Technical Education Personnel Development Needs, 1971-1975.
SPONS AGENCY	Michigan State Dept. of Education, Lansing.
PUB DATE	Nov 71
NOTE	288p.
EDRS PRICE	MF-$0.65 HC-$9.87
DESCRIPTORS	Manpower Development; *Personnel Needs; *Program Descriptions; Program Planning; State Programs; *State Surveys; *Teacher Supply and Demand; Technical Education; *Vocational Education
IDENTIFIERS	*Michigan

ABSTRACT

The need for a comprehensive, coordinated plan of vocational-technical education personnel development in the state of Michigan prompted the establishment of guidelines for a study. Teacher education funds provided finances, and after a director was appointed the study began June 1970. This report supplies background information necessary for decision-making in establishing a state plan for personnel development equal to the requirements of the 1970's. A description of recent and prospective developments in vocational-technical education in the state, the supply and demand of personnel, and alternatives and recommendations are provided. (GEB)

MICHIGAN'S VOCATIONAL-TECHNICAL EDUCATION PERSONNEL DEVELOPMENT NEEDS 1971-1975



ED 060192

VT014675

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

MICHIGAN'S VOCATIONAL-TECHNICAL EDUCATION PERSONNEL DEVELOPMENT NEEDS 1971-1975

By

George W. Ferns, Professor
Michigan State University
East Lansing, Michigan

Sponsored by

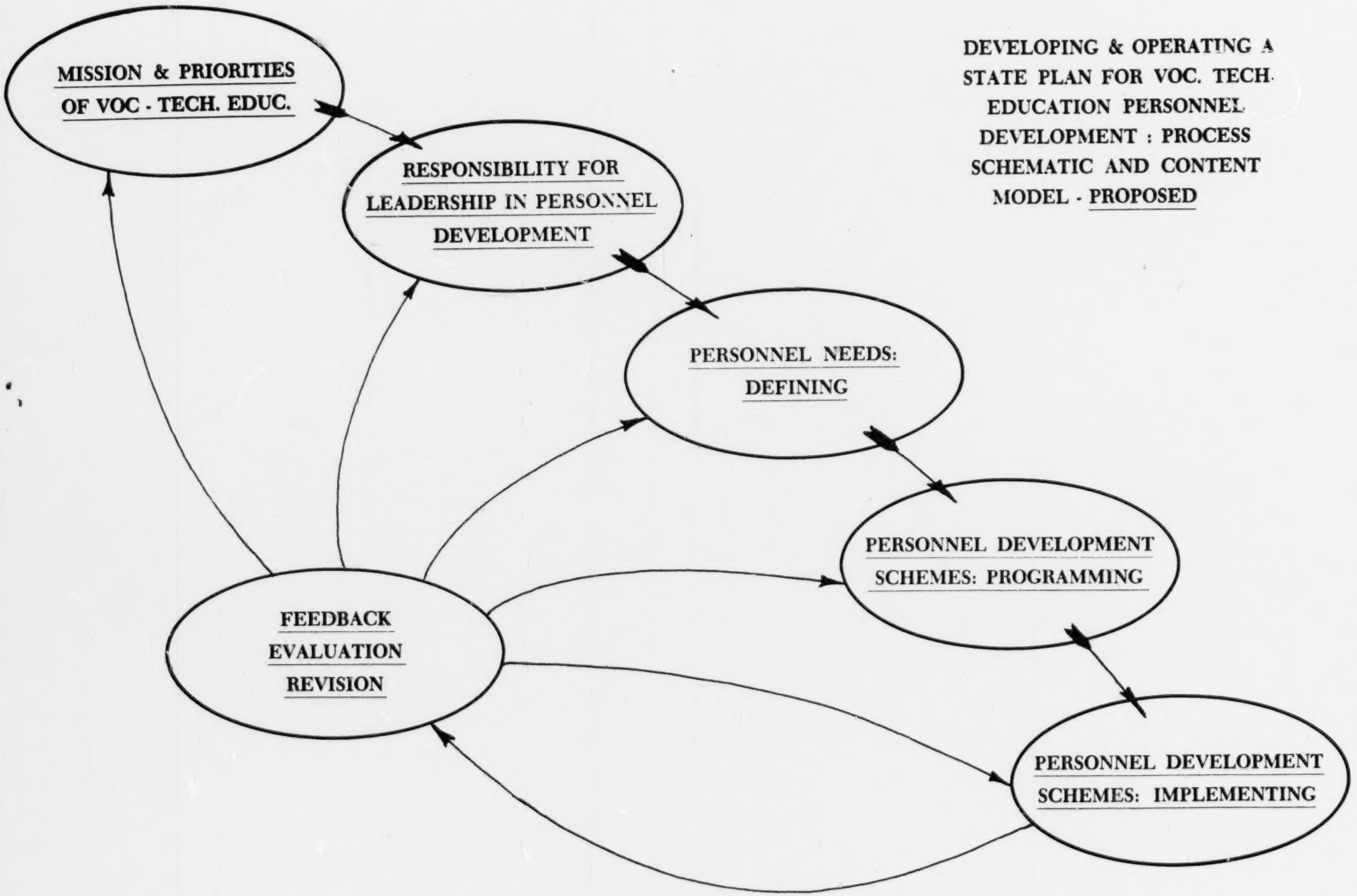
Vocational-Technical Teacher Education Contact Persons,
State-Supported Michigan Universities

and

Vocational Education and Career Development Services
Department of Education
State of Michigan

November 1971

DEVELOPING & OPERATING A STATE PLAN FOR VOC. TECH. EDUCATION PERSONNEL DEVELOPMENT : PROCESS SCHEMATIC AND CONTENT MODEL - PROPOSED


MISSION & PRIORITIES OF VOC - TECH. EDUC.
RESPONSIBILITY FOR LEADERSHIP IN PERSONNEL DEVELOPMENT
PERSONNEL NEEDS: DEFINING
PERSONNEL DEVELOPMENT SCHEMES: PROGRAMMING
PERSONNEL DEVELOPMENT SCHEMES: IMPLEMENTING
FEEDBACK EVALUATION REVISION

PREFACE

This study of vocational-technical education personnel development needs was sponsored by the eight Michigan occupational teacher education institution contact persons and the Vocational Education and Career Development Services Office, Michigan Department of Education. The report supplies background information necessary for decision making in establishing a comprehensive, viable, coordinated state plan for personnel development equal to the requirements of the 1970's. While intended for those wishing to understand better the existing system of personnel development in Michigan, its problems and potential, primarily it is for those individuals who will participate in creating improved delivery systems and ultimately in establishing a formal state plan. School employers, State Department of Education personnel, university personnel, leaders of professional organizations, individuals considering careers in vocational-technical education, and planning personnel in other public agencies and in private organizations should find this report of value. Vocational-technical education planners in other states and in federal offices also may find it of interest.

This is the first major study of vocational-technical teacher education in Michigan since the Vocational Education Evaluation Project was conducted ten years ago. In that project, directed by Lawrence Borosage of Michigan State University, a Teacher Education Task Force, chaired by George Kohrman and Adrain Trimpe of Western Michigan University, evaluated the status of vocational teacher education and reported its findings in the publication entitled Vocational Teacher Education in Michigan, Michigan Vocational Education Evaluation Project, Western Michigan University, 1963. Although the present project was done with somewhat different objectives in mind, it does update and expand the description of vocational-technical teacher education in Michigan. Beyond this, it is unique in that it attempts to provide the information necessary for improving the system of occupational education personnel development by defining quantitative and qualitative personnel problems, by recommending alternative solutions, and by suggesting a model for organizing and conducting a state plan for personnel development.

Readers of this report may have a tendency to examine only the introductory and recommendation sections, thus ommitting the main stream of development leading to the recommendations posted. It is suggested that the entire report be covered so as better to understand and evaluate the recommendations made in the final section. It is particularly important to understand the development of quantitative personnel requirement projections made in Section IV, which reveal prospects of oversupply and undersupply in various occupational areas. Such projections are plagued with the usual frustrations involved in crystal ball gazing, and must be considered for what they are--forecasts based upon imperfect data and assumptions. Full responsibility for the quality of this report, its positive and negative aspects, is accepted as mine.

Certain shortcomings of this report are apparent. No description of private vocational schools and other public agencies' personnel needs have been included. These needs were excluded from the study when it was designed, due to the magnitude of the total task ahead. Special Needs programs proved too elusive to describe adequately in the length of time available. Definition of personnel needs in this area should continue to receive high-priority attention. Personnel demands for World of Work programs should also become more clear during 1971/72.

Obviously, many findings in studies of this type can be outdated by events almost as soon as they are reported. The new Career Education thrust led by the State Vocational Education and Career Development Services Office is now emerging with vigor, and will actuate numerous specific personnel development requirements, most of which have been noted in this report. The thrust cannot succeed without directing attention to satisfying these needs. Therefore, it becomes imperative for the State Office to proceed immediately to give full-time leadership to the development and operation of a coordinated state plan for personnel development.

Words of appreciation are extended to many persons, but particularly to the project sponsors for the latitude allowed me in carrying out the contract. Special thanks are directed to Karl Stearns, Consultant, for his continuous assistance and insights. Without his constant support and sense of humor this report might well have fallen short of its mark. Gratitude is expressed to the personnel of the State Vocational Education and Career Development Services Office and the Research Coordinating Unit for their cooperation. Nearly every consultant, supervisor, and secretary gave assistance at some point in the project. I am indebted to the scores of administrators, teacher

educators, consultants, coop coordinators, and others throughout Michigan for their frank responses and participation during personal interviews and group discussions.

A special debt of gratitude is due the project staff, who extended themselves many times beyond the usual job requirements: to Bonnie Zurbuch project secretary, for her thoroughness and professional-level competence; to Carlos Schmitt for his professional insights and managing of project data collection and processing; to Lowell Zurbuch for his capable attention to many special assignments, including the cover design for this report; and to John Jellema, who did much in the final weeks to assist in the production of this report volume. Also, I am deeply indebted to Laura, my wife, and to our children, Steve, Beth, Sarah, and Martha, for their understanding attitudes and assistance over the sixteen months this project has spanned.

George W. Ferns
November 1971

TABLE OF CONTENTS

		Page
PREFACE.		ii
Section		
I.	INTRODUCTION	1
	Background.	1
	Purposes and Objectives	3
	Arrangements	6
	Terminology and Scope	6
II.	RECENT AND PROSPECTIVE DEVELOPMENT OF VOCATIONAL-TECHNICAL EDUCATION IN MICHIGAN .	9
	Description of Michigan Vocational-Technical Education System	9
	Other Programs Administered by State Vocational Education Service	10
	Manpower Development and Training . .	10
	Itinerant Instructor Program. . . .	13
	Private Occupational Education . . .	13
	Responsibility for Vocational-Technical Education.	15
	Prospective Development of Vocational-Technical Education	16
	General Factors Likely to Affect Program Development.	16
	Public Pressure	16
	Financial Constraints	17
	Implications of Manpower Trends. .	18
	Goals and Priorities	24
	Some Directions in Implementation .	27
	Trends in School Population in the 1970's	27
	Projecting Future Enrollments--Composite	28
	Prospective Development--Secondary Level	35
	Availability of Opportunity . . .	35
	Development Plans	36
	Curricular Organization	39
	Enrollment Projections--Secondary Level	40
	Disaggregation of Secondary Enrollment Projection by Occupational Code	43

Section | Page

Prospective Development--Post-Secondary Level 47
Availability of Opportunity . . . 47
Development Plans 48
Enrollment Projections--Post-Secondary Level. 48
Disaggregation of Post-Secondary Enrollment Projection by Occupational Code 50
Prospective Development--Adult Occupational Education. 55
Availability of Opportunity . . . 55
Development Plans 55
Enrollment Projections--Adult . . 57
Disaggregation of Adult Enrollment Projection by Occupational Code . 59
Summary of Enrollment Projections . . 59
Summary. 64

III. SUPPLY OF PERSONNEL. 65

Existing Stocks of Personnel. 65
Secondary Personnel. 67
Teachers and Coop Coordinators . . 67
Administrators/Supervisors/Directors. 72
Consultants/Specialists 78
Guidance and Placement Personnel . 78
Paraprofessionals 78
Secondary Area Vocational Center Personnel 78
Community College Personnel 79
Teachers 79
Administrators 81
Consultants 81
Guidance and Placement Personnel . 81
Paraprofessionals 82
Adult Education Personnel. 82
State Office Personnel. 82
University and Four Year College Personnel. 82
Sources of Personnel 85
Teacher Education Grads Who Postpone Entry 89
Former Teachers 89
Qualified Teachers from Non-Teaching Positions in Education. 89
Qualified Teachers Who Have Been in Higher Education, Overseas, and Private Schools 90
Individuals with Degrees but without Complete Teacher Education Qualifications 90

Section Page

Persons without Degrees or Teacher Education from Business, Industry, Military, etc. 91
Graduates Currently Completing Teacher Education Programs 93
NEA Survey of New Supply 94
University Outputs of Initial Certificates. 94
Specializations 101
Graduate Degree Outputs 106
Private Colleges Outputs 106
Attrition Rates 110
Existing System of Teacher Education . . 112
Focus of Responsibility 112
History of Program Authorization . . 113
Programs Offered. 116
Institutional Organization 116
Trends in Undergraduate Preservice Program Inputs 118
Field Service Operations 119
Special Workshops and Institutes for Vocational-Technical Education Personnel 122
Attention to Special Needs 123
Inservice Activities of School Units . 124
Orientation Programs 124
Inservice Schemes 125
Incentives. 126
Other Institutions and Agencies Involved in Personnel Development . . 127
Resources for Personnel Development . 128
Vocational Teacher Certification Code. 129
Summary. 131

IV. DEMAND FOR PERSONNEL 132

Review of Former and Existing Personnel Demand Projections. 132
National Projections 132
Michigan Projections 138
Methods for Projecting Demand 138
Personnel Requirements--Quantitative . . 141
Teacher and Cooperative Coordinator Requirements 141
School Employer Interviews . . . 141
Student Enrollment Projection Base. 148
Occupational Specializations Which Were Difficult to Fill 173
Administrator/Supervisor/Director Requirements 176
Secondary Administrators 176
Post-Secondary Administrators . . 178

Section Page

Consultant and Specialist Requirements 179
Guidance and Placement Requirements . 181
Researcher Requirements 181
Paraprofessional Requirements . . . 182
University Teacher Education Requirements 182
Summary of Personnel Requirements--Quantitative 183
Personnel Requirements--Qualitative . . 183
Qualities Sought in Professional Personnel According to Vocational Administrator Interviews 183
Qualities Sought in Vocational-Technical Personnel According to Co-operative Coordinator, Administrator, State Office Consultant, and Teacher Educator Conferences 185
Competencies and Training Needs of Secondary and Post-Secondary Occupational Teachers. 187
Competencies and Training Needs of Cooperative Coordinators. . . . 189
Competencies and Training Needs of Administrators/Supervisors/Directors. 190
Competencies and Training Needs of Consultants/Specialists 191
Competencies and Training Needs of Guidance and Placement Workers. . 192
Competencies and Training Needs of Paraprofessionals 193
Competencies and Training Needs of Special Needs Workers. 193
Competencies and Training Needs of Teacher Educators 194
Summary. 195

V. ALTERNATIVES AND RECOMMENDATIONS 196

Major Goals for a Plan. 196
Variables to be Recognized 198
Design of a Plan. 201
Implementing a Plan. 204
A Unique Plan for Michigan 205
Responsibility for Personnel Development. 206
State Personnel Development Unit . . . 206
Personnel Development Advisory Group . . 209
Teacher Education Coordinating Council . 210
University Organization for Vocational-Technical Personnel Development . . . 211
Program Authorization 213
Contracting 216

Section		Page
	Resources for Personnel Development	
	Annual and Long-Range Personnel Development Planning	217
	Emphasis on Qualities and Competencies Needed	218
	Personnel Data Bank	218
	University Output and Activity Records	219
	Record of Emigration and Immigration	220
	USOE Occupational Classification Code	221
	Certification	221
	Alternative Routes to Vocational-Technical Teaching	222
	Preservice Programs	224
	Inservice Programs	224
	Recruiting Former Military Personnel	226
	Reciprocity Between Universities	230
	Directory of Training Opportunities in the Private Sector	231
	Incentives	231
	Emphasize Commonalities	232
	Teacher Supply Recommendations by Occupational Field	233
	Cooperative Work Experience Coordinators	234
	Administrators/Supervisors/Directors	238
	Consultants/Specialists	238
	Guidance and Placement Personnel	239
	Researchers	240
	Paraprofessionals	241
	Emerging and Special Needs Requirements	241
	Teacher Educators	241
	Summary	243
BIBLIOGRAPHY		244
APPENDICES		245
		259

SECTION I

INTRODUCTION

The need for a comprehensive, coordinated plan of vocational-technical education personnel development for Michigan came into sharp focus in the late 1960's, due to concerns of teacher educators, school administrators, and State Office personnel which converged on the necessity of joint action if an adequate supply of personnel was to be available to operate Michigan's expanding occupational education system. Early in 1969, the teacher education contact persons (a group consisting of one appointed representative from each of eight state-supported universities and colleges involved in vocational-technical teacher education), in concert with Michigan Department of Education, Vocational Education and Career Development Services, established guidelines for a comprehensive study of the professional personnel development needs in the 1970's. Financial resources were set aside from teacher education funds, and a search for a study director was begun. Slightly more than a year later a director was identified, and the project was commenced on a full-time basis in June, 1970.

Background

Among the many factors prevailing then (and now) which motivated setting this project in motion were the following:

*1. A profile of the supply and demand situation in the 1970's was needed, due to the continuing shortage of qualified personnel in vocational-technical education at all levels and in vocational guidance.

*2. Strong encouragement had been given at the federal level for states to plan coordinated professional personnel development schemes.

*3. It was believed that the highly effective teacher education programs extant in Michigan could become more productive and could complement each other through a coordinated program.

*4. The 1968 Amendments to the National Vocation Education Acts and the Education Professions Development Act authorized funds to be used to improve vocational-technical teacher education, given adequate state planning for their use.

*5. New local and area programs already under way, and others being planned, called for new or modified programs of vocational teacher education.

6. The recent emphasis on needs of the disadvantaged and handicapped had stimulated demand for new kinds of vocational-technical professional personnel.

7. There was a need to search out and create new alternative means or models for professional personnel development.

8. There was a need for clarification and guidelines for soliciting, developing, and evaluating specific personnel development project proposals.

9. Michigan teacher educators, school administrators, vocational-technical teachers, and other concerned educators were in agreement on the urgent need for a coordinated state plan for professional personnel development.

10. The Michigan Department of Education, Vocational Education and Career Development Services, with support from the Research Coordinating Unit, appeared willing to assume responsibility for the development of a coordinated professional personnel development scheme and its subsequent implementation.

---

*From original proposal document.

Purposes and Objectives

The signal purpose of this effort was to perform a background investigation aimed at defining the professional personnel development needs and identifying ways and means for their achievement. The resulting report would form a foundation for designing a comprehensive plan for coordinating efforts of teacher education institutions and other units to staff Michigan occupational education programs with an adequate supply of appropriate personnel in the 1970's.

The specific purposes of this study were initially stated to be:

> To develop a comprehensive plan for the selection and preparation of persons for staffing of programs of occupational education in high schools, area vocational centers, and community colleges, and for their inservice education; to develop recommendations for certification requirements and procedures for qualifying vocational and technical teachers; and to develop recommendations whereby each teacher education institution could contribute to the recruitment and preparation of a more nearly adequate supply of competent vocational teachers.

These purposes were subsequently expanded by the study director into objectives for the project as follows:

1. To analyze vocational-technical education professional (and paraprofessional) personnel needs in Michigan during the next five years.

2. To determine the quantitative and qualitative aspects of the demand for vocational-technical professional personnel in Michigan's secondary schools, area vocational centers, community colleges, universities, school districts, and state department.

3. To assist in determining personnel needs for new and emerging programs, such as those for the handicapped, disadvantaged, and unemployed.

4. To study institutions, agencies, and other organizations engaged in recruiting, educating (both preservice and inservice), and placing personnel to determine past and probable future outputs, training capabilities, and plans.

5. To analyze the extent to which "consumer" demand for personnel is likely to be met by the "producers" of the supply, taking into account attrition and other factors, thus silhouetting shortfalls which become Personnel Development Objectives.

6. To identify Personnel Development Objectives which may be met by existing programs and those which will require new programs.

7. To recommend criteria for establishing priorities among Personnel Development Objectives, which are congruent with local, state, and national needs.

8. To identify categories of vocational-technical educators as target groups for professional development projects and to initiate involvement of these groups in identifying specific professional development needs.

9. To identify alternative training means (models, strategies, systems) and recommendations for solving the supply problems upon which a long-range state plan for professional personnel development may be built.

10. To identify specific illustrative projects and programs suitable for professional personnel development in Michigan.

11. To identify available and potential resources and make recommendations for their efficient utilization.

12. To make recommendations for implementing and managing professional development programs and projects.

13. To recommend a system for inventorying personnel resources and needs on a continuous feedback basis.

14. To assist Michigan teacher education institutions in improving inter-institutional communications and in coordinating efforts.

15. To distinguish more sharply the roles and responsibilities of the State Department of Education, the teacher education institutions and agencies, professional organizations, and the employing school districts or units in meeting future professional personnel needs.

16. To review pertinent recorded information regarding vocational-technical professional personnel development needs and means.

17. To link local, state, and federal professional personnel development planning.

When embarking on this study, it was helpful to convert the quest into a series of concise questions capable of giving focus and direction. The following major questions were set for this investigation:

1. What are the vocational-technical personnel needs likely to be in the period 1971/72 through 1975/76?

2. What will be the nature of personnel supply?

3. What gaps between demand and supply are likely to develop?

4. Who should be responsible for vocational-technical personnel development?

5. What alternative means are available for bridging the gaps between demand and supply?

6. What kind of a statewide plan can be developed for coordinating personnel development activities?

The ultimate objective which this project supports, therefore, is the establishment of an improved comprehensive vocational-technical education personnel development scheme for Michigan. The entire process includes two phases. Phase One, that of determining the personnel development needs, defining problems, and recommending solutions, is covered by this report. This phase was concluded Summer, 1971, and the findings appear as this publication. Phase Two, that of preparing an actual state plan for personnel development, formally begins in Fall, 1971. Leadership for this phase should be supplied by the state, with thorough involvement of teacher education institutions and other appropriate groups. It should be

apparent that Phase One entails supplying the background information necessary for establishing a comprehensive, cooperative personnel development system, not writing a formal state plan document.

Arrangements

The project was carried out on a contractual arrangement between the Michigan Department of Education and Michigan State University, using funds set aside from the annual state and federal teacher education monies. It spanned the period from June 12, 1970 to August 31, 1971. The Michigan Department of Education furnished office space with the Vocational Education and Career Development Services in Lansing. The office was staffed by a full-time director, a three-fifths time assistant, and a full-time secretary. The eight vocational teacher education institutional representatives and the Director of Vocational Education and Career Development Services, Michigan Department of Education, sponsored and advised the project.

Terminology and Scope

The term "personnel development" is frequently used instead of "teacher education" throughout this study, since the former implies a broader concept of personnel needed to staff the schools. Whereas "teacher education" can refer to the development of only one major category of education personnel, "personnel development" is capable of encompassing the entire range of types desirable for staffing vocational education operations. Not only that, it can also accommodate new occupational types which may arise in the future. The term "teacher education" is sometimes used in this report to refer to a body of content often known as pedagogy, which is one component in the full preparation of teaching personnel.

The personnel types examined in this project are teacher, teacher/cooperative coordinator, administrator/supervisor, consultant/specialist, guidance and placement worker, researcher, paraprofessional, and teacher educator, albeit the latter is actually a composite of several of the former and therefore is of a somewhat different order. Although it was difficult to secure data and make judgments as to certain aspects of all these types, all are recognized throughout to the extent possible.

Various types of units in the educational enterprise are encompassed in this study, since they represent the locus of demand of personnel, both qualitative and quantitative. K-12 districts, intermediate school districts, secondary area vocational centers, community colleges, universities and four-year colleges, and the State Office are the focus as to types of education units. Teacher requirements for secondary, post-secondary, and adult programs receive major emphasis throughout. Four-year colleges and universities engaged in vocational-technical education personnel development are considered as a unit, since they represent another type of employer which also seeks appropriate personnel. Personnel requirements for programs in agriculture, distributive, health, home economics, office, technical, and trade education are included.

The personnel needs of private schools and those of other governmental agencies involved in vocational-technical type training are not directly included in this study, due to their magnitude and inaccessibility as related to time available for this study.

This study is limited in certain other important ways. The requirements for practical or applied arts teachers are not defined, since that is not the purpose of the study. However, data on past and future university outputs of new personnel with initial teacher certification in the practical or applied arts were collected and are presented in Section III, since they represent a potential supply source of vocational teachers if they are given added work experience and courses.

Quantitative personnel needs are largely limited to those of reimbursed vocational-technical programs, since State Office data on these programs are the only reasonably reliable information available on which to base projections into the future. It is recognized that many nonreimbursed vocational programs and personnel are excluded as a result. Neither the State Office nor any other source collects data which recognize both reimbursed and nonreimbursed vocational-technical education programs.

The prospective development of vocational-technical education in Michigan is examined and future enrollments through 1975/76 are projected in Section II. The system for preservice and inservice preparation, existing stocks of personnel, sources of personnel, and outputs are described in Section III. In Section IV, demands for personnel are projected and compared with anticipated

supply, thus silhouetting the quantitative requirements through 1975/76. Qualitative needs by personnel types, in terms of desired competencies, are also included. This report concludes with Section V, in which a series of recommendations for meeting expected personnel needs are set forth.

SECTION II

RECENT AND PROSPECTIVE DEVELOPMENT OF VOCATIONAL-TECHNICAL EDUCATION IN MICHIGAN

To detect possible professional personnel needs of the future, it is important to examine the recent and prospective development of vocational-technical education in Michigan. But first, a brief description is in order, to put into perspective the vocational-technical education system couched in the total State of Michigan education pattern.

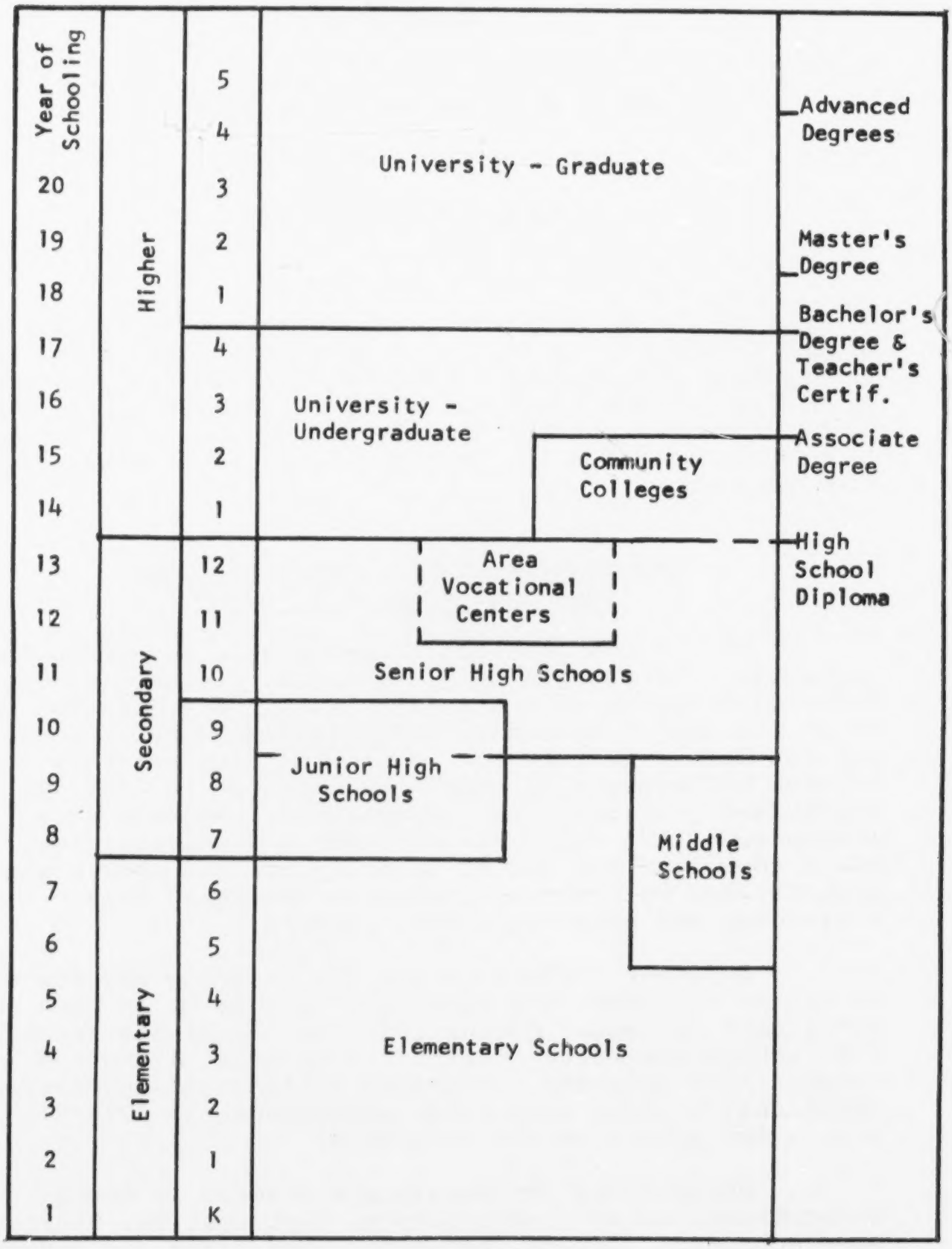
Description of Michigan Vocational-Technical Education System

Michigan's plan for formal public education from elementary through graduate levels has elements of occupational programs at nearly all levels, although the bulk is at the senior secondary and post-secondary or community college levels (Figure 1). Post-secondary programs were offered by twenty-nine community colleges in 1969/70. Reimbursed post-secondary occupational programs were conducted by ten four-year colleges and universities. Adult education for out-of-school youth and adults was administered by numerous community colleges, K-12 districts, and area vocational centers.

Secondary offerings are the largest, and are sited at either comprehensive secondary schools or in area vocational centers. During 1969/70, 443 of 534 secondary K-12 school districts offered one or more reimbursed occupational programs. Thirteen designated secondary area vocational centers were fully operational in 1970/71, with a few others on the threshold.

Occupational curricula are offered in seven occupational areas: agriculture, distributive, health, home economics, office, technical, and trade and industry.

FIGURE 1.--MICHIGAN SYSTEM OF PUBLIC EDUCATION, 1971.



Appendix 1 contains composite enrollments by these occupational areas from 1918 through 1970. Occupational program enrollments (1969/70) are further categorized along lines of disadvantaged, handicapped, elementary and secondary, post-secondary, adult, apprenticeship, work-study, and cooperative (Appendix 2).

Prevocational offerings, sometimes referred to as the practical or applied arts, are found in junior high schools, extending upward into the senior high school and downward into the middle grades. Increasing attention is being given to the development of "World of Work" and group guidance experiences throughout the elementary and junior high school levels.

A summary of 1969/70 reimbursed occupational programs at secondary, community college, and four-year college levels by occupational areas is presented in Table 1, and reimbursed occupational enrollments appear in Table 2.

TABLE 1.--NUMBER OF REIMBURSED OCCUPATIONAL PROGRAMS AT SECONDARY, COMMUNITY COLLEGE, AND FOUR-YEAR COLLEGE LEVELS, 1969/70

Program Levels	Agric.	D.E.	Health	Home Ec.	Office	Tech.	T&I	TOTAL
Secondary	178	161	20	392	226	2	170	1,149
Community College	8	18	23	10	29	16	28	132
Four-Year College	1	5	0	0	4	2	8	20
TOTAL	187	184	43	402	259	20	206	1,301

Source: (70).

Other Programs Administered by State Vocational Education Service

Manpower Development and Training

Manpower Development and Training Act programs 1962-1970 constitute a substantial portion of the occupational education picture in terms of numbers of trainees

TABLE 2.--VOCATIONAL EDUCATION ENROLLMENTS 1969-70.

1 Program	2 Total Enrollment	3 Secondary Grades 9-12	4 Post- Secondary	5 Adult	6 Apprenticeship	6* Disadvantaged & Handicapped
Agriculture	14,121	12,380	704	1,037	0	123
Distributive	37,868	16,344	2,847	18,677	0	2(2458)
Health	7,774	2,890	3,968	916	0	(44)
Home Economics	96,239	77,517	262	18,460	0	394
Office	60,323	38,946	10,728	10,649	0	100(5483)
Technical	9,844	0	7,739	2.105	3	(41)
Trade & Industrial	100,767	21,841	8,706	70,220	20,723	1151 (373)
GRAND TOTALS	326,936	169,918	34,954	122,064	20,726	1770(8399)

*Enrollments shown in column 6 are included in columns 3, 4, and 5 and in totals, column 2. Quantities outside parentheses represent persons enrolled in special classes. Quantities within parentheses represent persons enrolled in regular classes.

Source: (59)

and projects and in social significance (Table 3). Purposes include (1) retraining workers whose skills have become obsolete, (2) alleviating critical manpower shortages, and (3) assisting the hard-core unemployed and disadvantaged. Training is provided by four-year colleges, community colleges, secondary schools, private schools, hospitals, etc.

TABLE 3.--MANPOWER DEVELOPMENT TRAINING ACT PROGRAMS, 1962-1970

Fiscal Year	Projects	Trainees
1962	29	836
1963	82	3,589
1964	118	5,383
1965	139	8,891
1966	127	7,994
1967	79	6,117
1968	35	3,847
1969	75	3,794
1970	83	4,857
TOTAL to Date	767	45,308

Source: (70)

Itinerant Instructor Program

Another significant program which does not appear in Figure 1 is the Itinerant Instructor Plan for building trade apprentices, which in 1969/70 had sixteen instructors operating in twenty-one centers, serving 1721 apprentices and 315 cities (Table 4). The budget and supervision for this program are assigned to the Vocational Education and Career Development Services of the Michigan Department of Education.

Private Occupational Education

Nonpublic institutions make an important contribution to the vocational-technical education system in Michigan. These include private proprietary schools, schools operated by businesses and corporations for internal purposes, and private nonprofit schools, such as parochial secondary schools.

TABLE 4.--ITINERANT INSTRUCTOR PROGRAM, 1969/70

Number of Instructors	Trade	Number of Apprentices	Number of Centers
2	Bricklayer	211	11
4	Carpenter	411	15
3	Electrician	293	10
5	Plumber	598	17
2	Ironworker	208	7
16		1,721	21

Source: (70)

The number of Michigan-based licensed occupational schools has increased steadily in the past five years (Table 5). Enrollments have risen markedly, too, nearly doubling in the same period (Table 6). As of July, 1971, there were 284 private schools operating in Michigan; of these, 180 were licensed instate and 104 were from outstate.

TABLE 5.--NUMBER OF LICENSED PRIVATE OCCUPATIONAL SCHOOLS, 1966-1970

Type of School	Number of Schools					
	FY-66	FY-67	FY-68	FY-69	FY-70	FY-71
Business and Data Processing	45	49	60	62	66	--
Trade or Other Occupations	61	65	75	95	101	--
Correspondence*	4	5	5	7	8	--
TOTAL	110	119	140	154	175	180

*Eight resident schools also offer correspondence courses.

Source: (70)

TABLE 6.--ENROLLMENTS IN LICENSED PRIVATE OCCUPATIONAL SCHOOLS, 1966-1970

Type of School	Number of Schools				
	FY-66	FY-67	FY-68	FY-69	FY-70
Business and Data Processing	12,600	13,923	15,849	16,047	19,919
Trade and Other Occupations	9,646	13,928	12,735	14,703	17,391
Correspondence*	1,332	4,931	4,607	7,319	5,698
TOTAL	23,578	32,782	33,191	38,069	43,008

*Eight resident schools also offer correspondence courses.

Source: (70)

Quite obviously, private occupational education is responding to certain needs not being met by its public counterpart.

Although private occupational education constitutes an important segment of the total picture, limitations of time have necessitated elimination of its staffing needs from this report. Staff for these schools is predominantly recruited directly from business and industry, not from public teacher stocks, and is sometimes trained by school management. This is not to indicate there is no interchange of personnel between the private and public sectors, nor any lack of concern for the quality and quantity of personnel supply for private schools.

Responsibility for Vocational-Technical Education

During the past fifty years, responsibility for providing occupational education for both the young and the mature citizens of Michigan has increasingly become a matter of public concern. The bulk of formal vocational training prior to World War I was worked out primarily between individuals and private business or industry, with notable exceptions, such as the Morrill Act and vocational education programs operated in certain states and large cities.

At present, occupational education, with its purposes of (1) developing individuals to the fullest extent of their potential, and (2) training the kinds of manpower needed by a modern technological society, is a public responsibility shared with the private sector of business and industry. Public responsibility is shared and supported at the local, state, and federal levels, but in unequal amounts. According to the 1971-72 budget estimates, the bulk of financial support is provided at the local level (74%), with federal and state sources contributing 23% and 3%, respectively.

The locus of responsibility for coordinating the implementation of vocational education in Michigan is assigned to the State Vocational Education and Career Development Services, while the direct administration of local programs is a duty of local education agencies.

Prospective Development of Vocational-Technical Education, 1971/72-1975/76

General Factors Likely to Affect Program Development

Public Pressure

The historical predominance of college preparatory and general curricula continues in secondary schools, and is evidenced by enrollments and assignment of dollar resources. This is but a reflection of the value system of society. A large number of Americans continue to aspire for college degrees and the professions. Vocational-enrollments have increased gradually in basic number, as well as in percentage of total 9-12 enrollments, but during the past three years this percentage of total enrollments has hovered near 28%. It is likely this condition will persist until such time as dollar resources are increased and/or individuals view vocational-technical occupations as being sufficiently rewarding and secure to provide an acceptable life style and standard of living. There is evidence to suggest that an increasing number of citizens may be nearing this point. The increasing scarcity of employment prospects for college graduates is quite in contrast with somewhat better opportunities in subprofessional occupations. Equalitarian trends in both salaries and wages, as well as fringe benefits, tend to decrease the differential, and some people are taking note. The relatively smaller sacrifice in terms of time and dollars required to reach subprofessional occupations and thus achieve a satisfactory livelihood is becoming

more evident to many. It appears that secondary and post-secondary occupational education have excellent prospects of becoming increasingly acceptable alternatives to youth. Similarly, Manpower Development and Training Act programs and other adult programs have received visibility. This should add up to an increase in public pressure for occupational education opportunities.

Financial Constraints

Serious constraints are placed on occupational education by inadequate funding, particularly at the state level. The low level of state support for occupational education is dramatized by this statement:

> The need for substantial increases in state support of vocational education was emphatically pointed to at each of the eight public hearings held on the State Plan. Attention was called to Michigan's 27th position in the ranking of states in terms of state funds for vocational education and to the $1.99 million of state funds for vocational education from a total budget approaching $1 billion for education in Michigan. (70)

Action was taken by the Michigan Legislature last year to authorize an additional $16.8 million, but these funds had not been appropriated at the time of this writing.

Scarce dollars are the greatest dampening factor in plans for continued development of a network of approximately seventy-five secondary area vocational centers. Upgrowth has been slowed to a snail's pace for lack of capital and operating funds. Only thirteen vocational centers are currently fully operative, with three or four more likely in 1971/72 and four or five probable in 1972/73. Beyond that, the prospect of new starts is very bleak. The very regions in greatest need of area center occupational education are frequently the least able financially to provide it for themselves. Until new ways are found to finance the construction, equipping, and operation of area centers, further development will be slow indeed.

Vocational education expects allocations of nearly $16 million in federal funds and almost $2 million in state funds for 1971/72. Should both the Congress and the Michigan Legislature provide full funding authorized by their respective acts, an additional $9.4 in Federal Part B and $16.8 million in state funds would be available for program expansion. This would constitute a 145%

increase, which could break the blockage in area center development, but increases of this magnitude are not likely in the immediate future.

As to the State Vocational Education Services policy for annual allocation of state and federal dollars to local school units, it is anticipated that continued reductions in the reimbursement percentage of vocational education personnel salaries (approximately 15% for 1970/71) will not have a detrimental effect on availability of occupational education. Adoption of other priorities and practices presently under consideration is likely to provide more effective stimulus and support.

Implications of Manpower Trends

Since one of the basic purposes of vocational-technical education is to prepare people for gainful employment, it is quite logical that public vocational education should prepare persons for occupations for which there is a market; in other words, that programs be geared to real manpower needs and trends. Similarly, vocational-technical education personnel development needs should be geared, in turn, to vocational-technical education program needs which, it is assumed, are based upon real manpower needs and trends. Thus vocational-technical education personnel development needs are derived needs, one step removed from vocational-technical education programs and two steps removed from the economy itself, thereby illustrating the chain of relationships which must be reckoned with when considering personnel development needs and programs.

The effectiveness of this chain of relationships is often hampered, however, by factors such as the difficulties which local school districts encounter when attempting to adjust their programs to emerging regional manpower needs. For example, student preferences, existing school facilities, tenured faculty, and apparent local business and industry needs frequently tend to restrain efforts to adjust programs to recognized regional manpower needs. Thus personnel development program planners face an interesting dilemma; should they gear their output to meet present local program needs, which may well be lagging behind current manpower development trends, or should they bypass local considerations and key their programs directly to regional, state, and even national manpower needs? The answer must be a measure of both, but with an eye cast upon probable future manpower needs of the economy.

An original analysis of Michigan's manpower needs in the 1970's is not the purpose of this study. Existing state, regional, and national reports suffice, and some general observations are appropriate at this point.

What should be taught? The Michigan Manpower Study, which projects trends through 1980, appears to be the best Michigan manpower information source in terms of comprehensiveness and recency (47). Two graphs have been selected and included since they show expected growth rates by major industry (Figure 2) and by selected occupations (Figure 3). Similarly, national manpower trends as projected by the United States Department of Labor appear to be most appropriate for inclusion in this report (52). Expected trends by major industry (Figure 4) and by selected occupations (Figure 5) are presented. Attention is directed to the series of comments on each table, which generalize the projected trends and furnish clues as to what should be taught.

Who will be taught? Regarding the national scene, Kauffman made these observations:

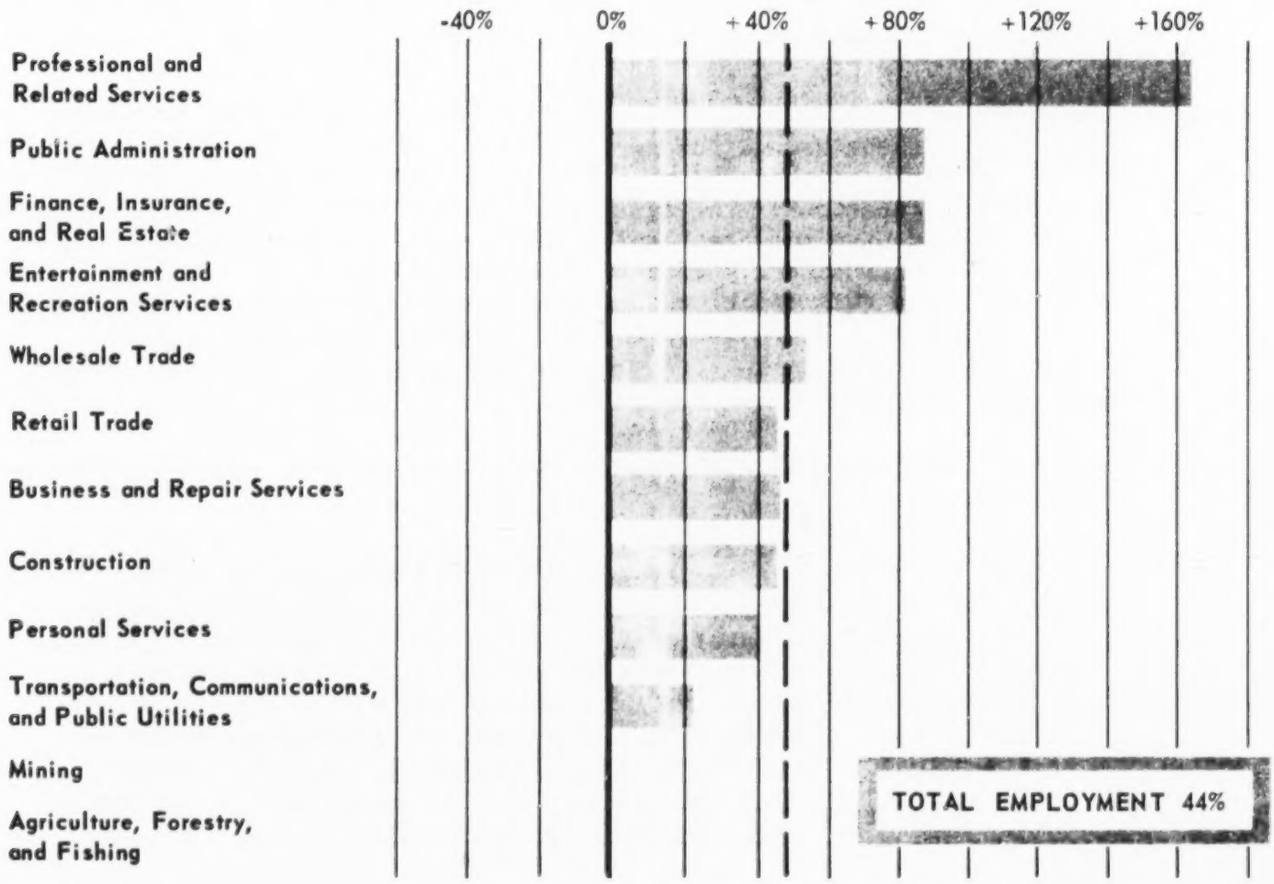
> (1) by 1975 one-quarter of the population aged 16 to 25 will be in the labor force, representing a 30 percent increase over a 10-year period; and (2) by 1975 about 40 percent of the increase in the labor force will be comprised of minority workers. These two trends would appear to indicate that vocational education must concentrate its efforts on the youth of the country and expand its efforts in training the economically disadvantaged. (27)

The Michigan picture was forecast by Smith as follows:

> Between 1960 and 1980, Michigan's total population will increase by 31 percent. However, the labor force which is age 20-29 will increase over 82 percent, thus reflecting the inflow of young people into that labor force. At the same time that the number of young people coming into the labor force will be increasing at so rapid a rate, all evidence indicates that higher and more complex levels of education and skill preparation have become increasingly essential for employment. (46)

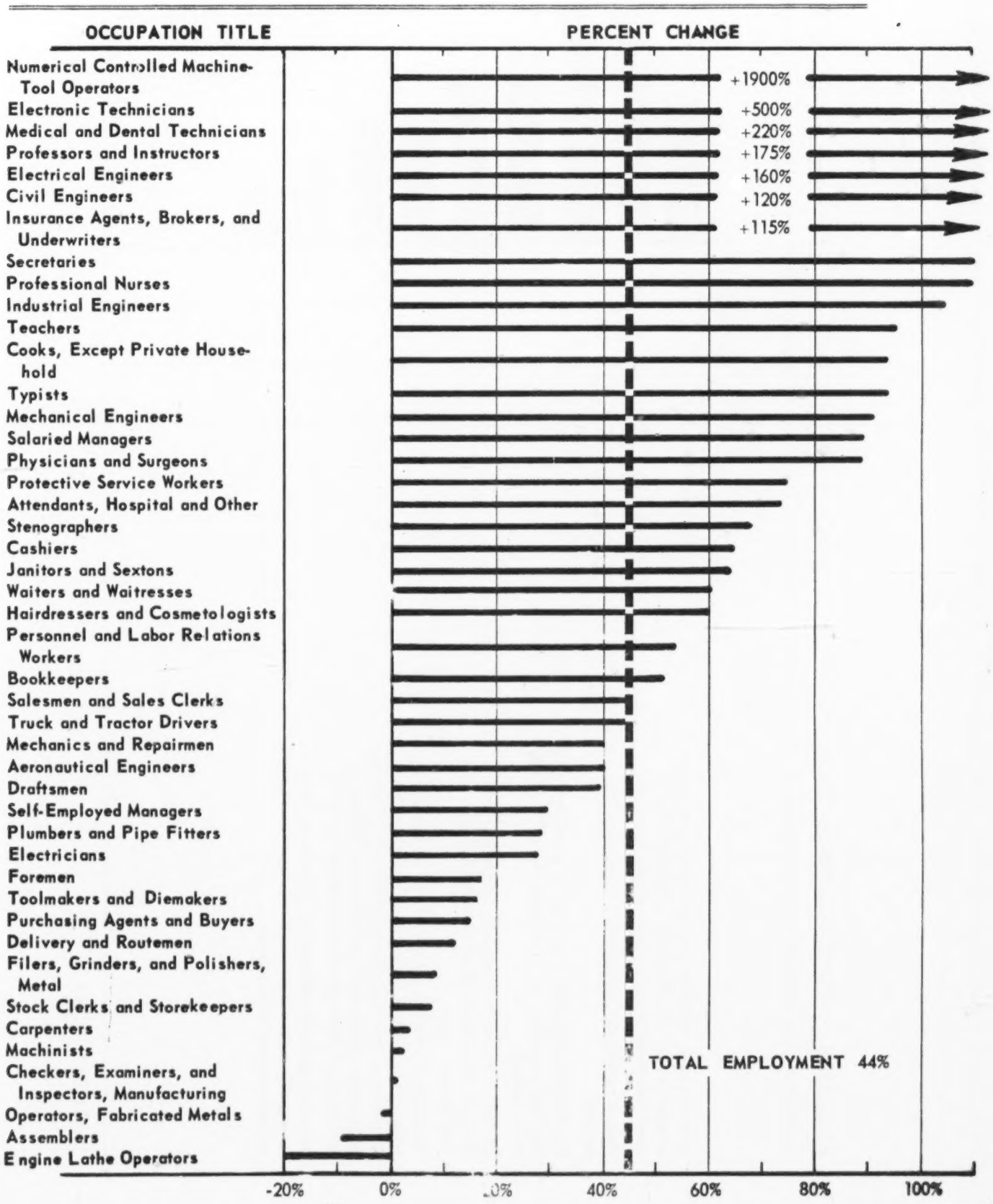
Implications of manpower trends also include higher educational requirements for specific occupations, caused by increased sophistication of the technological base. Some of this training will be provided by employers in private schools, but public avenues will also be needed

FIGURE 2.--PERCENT CHANGE IN INDUSTRY EMPLOYMENT LEVELS, MICHIGAN, 1960 AND 1980.



Source: (47)

FIGURE 3.--GROWTH FOR SELECTED OCCUPATIONS IN MICHIGAN, 1960-1980.



Source: (47)

FIGURE 4.--PROFESSIONAL, TECHNICAL AND SERVICE OCCUPATIONAL GROUPS WILL GROW FASTEST.

In this decade, as in the last, the fastest growing occupations are professional and technical, the ones requiring the most educational preparation.

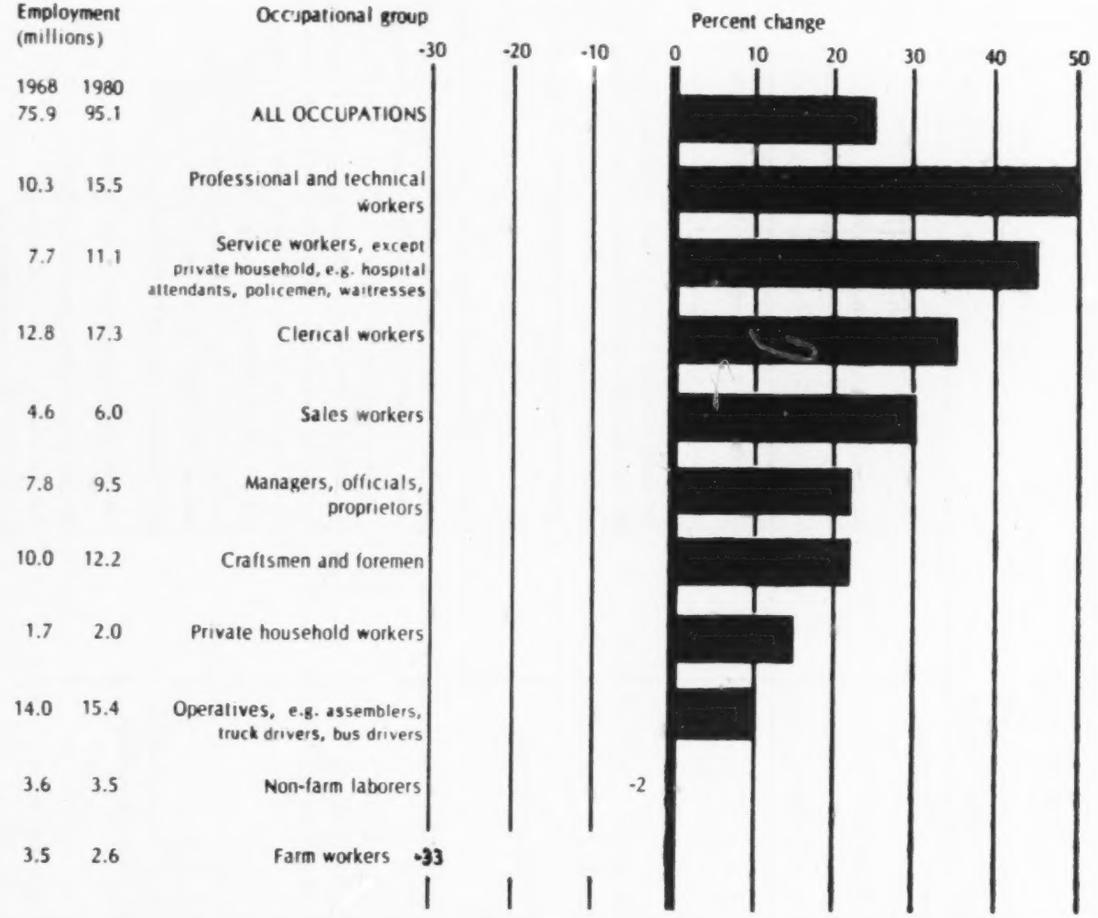
This occupational group will increase by 50 percent by 1980.

Service occupations (excluding private households) will rank second only to professionals with a growth of 45 percent.

By 1980, for the first time, there will be as many professional and technical workers as blue-collar operatives.

Yet there will be many good jobs in the economy for which a high school education is sufficient: there will be more than 15 million operative jobs. Clerical occupations, with more than 17 million workers, will be larger than any other occupational group.

Jobs in craft skills are increasingly well rewarded financially, reflecting a continuing need for highly skilled workers in the economy.



Source: (52).

FIGURE 5.--STATE AND LOCAL GOVERNMENT AND SERVICE INDUSTRIES WILL HAVE ESPECIALLY RAPID EMPLOYMENT GAINS.

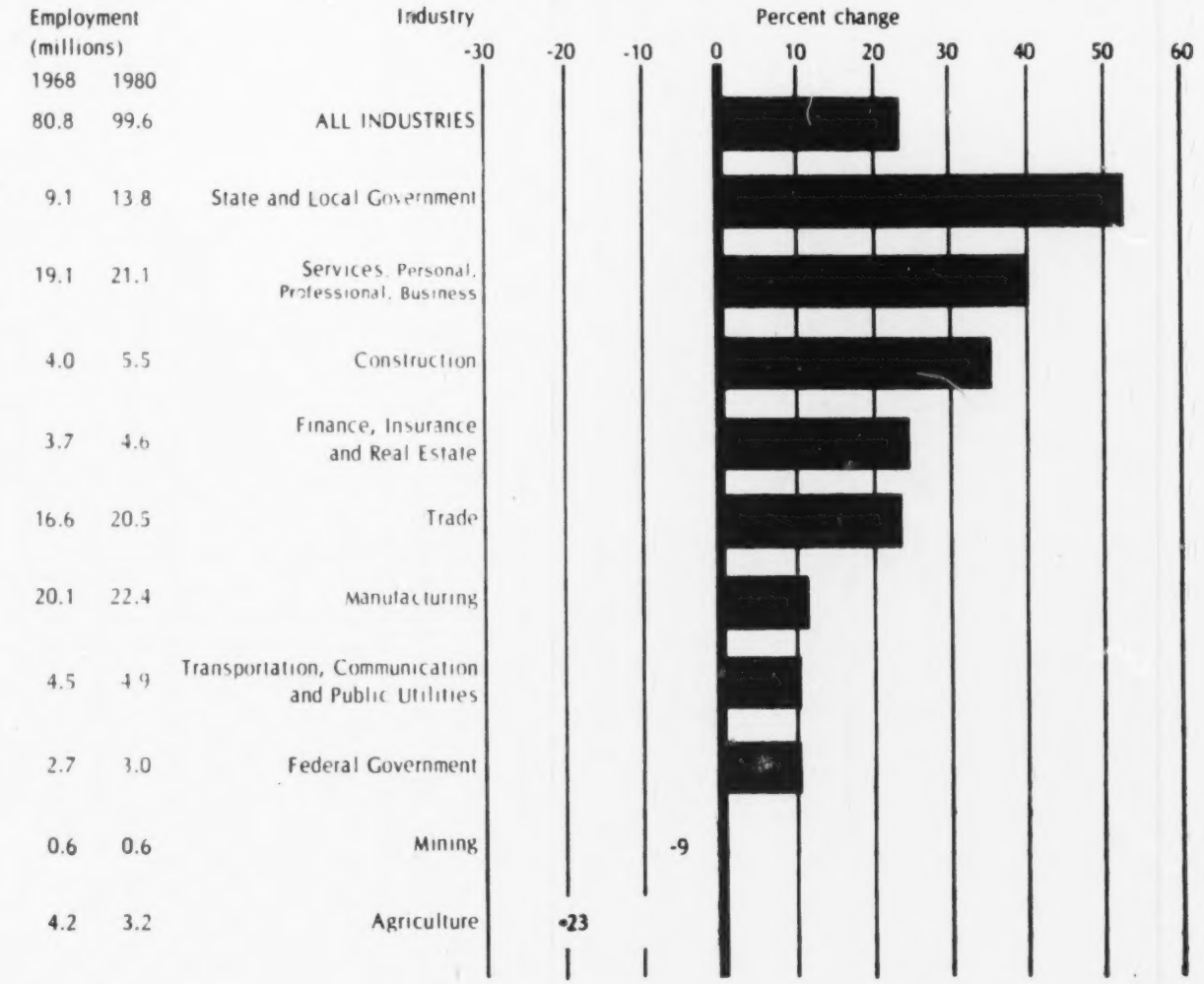
Employment trends of the past decade in the various industry sectors of the economy generally will continue in the '70's.

State and local government will experience the most rapid growth . . . a 52 percent increase in employment.

Services, with a 40 percent employment increase, and construction, with 35 percent, will follow.

While manufacturing will grow only 11 percent, it will still be our largest industry in 1980.

Agricultural employment will continue its historic decline . . . and by 1980 the nation's food will be grown by only 3% of the labor force.



Source: (52).

in increasing magnitude. Parallel to this trend has been a constant increase in worker aspiration for better jobs which demand better levels of training. Rising worker aspirations, therefore, increase the demand for vocational-technical education.

Perhaps the question of "Who will be taught?" should be changed to "Who should be taught?" since there are groups not receiving as much vocational educational training opportunity as they appraently need, namely the handicapped, disadvantaged, and unemployed. Federal and state financial assistance has improved and will continue to improve vocational education opportunities for these groups. The general trend toward increased occupational specialization over recent decades has made it possible to find occupations which are suitable for many of the handicapped. Furthermore, there is increased evidence that handicapped people can succeed in occupations at many levels. Similar comments can be made with regard to the disadvantaged. Therefore, a major task for vocational education should be to provide entry-level skill preparation for the handicapped, disadvantaged, and unemployed; and to supply supplementary vocational education services as well.

Goals and Priorities

If vocational education programs are responsive to the needs of society, it follows that national, state, and local goals and priorities must manifest the occupational education needs of all persons who can profit from such education. Legislative concern for current national vocational education goals is highlighted in the Declaration of Purpose of the Vocational Education Amendment of 1968:

> It is the purpose of this title to authorize Federal grants to States to assist them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis, so that persons of all ages in all communities of the State--those in high school, those who have completed or discontinued their formal education and are preparing to enter the labor market, those who have already entered the labor market but need to upgrade their skills or learn new ones, those with special educational handicaps and those in post-secondary schools--will have ready access to

> vocational training or retraining which is of high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment, and which is suited to their needs, interests, and ability to benefit from such training. (76:Section 101)

It seems clear that Congress is urging all educational leaders to establish occupational education opportunities for all persons, whether they are proceeding toward college or immediate entry or reentry into the world of work. The goals focus greater attention on education designed to minimize inequalities in our society and maximize individual opportunities. Grant Venn stated that goals for the United States Office of Education must be directed to the issues in our society. These issues as identified by Venn are: (1) discrimination, (2) the generation gap, (3) unemployment and underemployment, (4) lack of quality and relevance in education, (5) decay of cities and regions in the country, (6) disrespect for law and order, (7) lack of hope for many adults, (8) conservation of the nation's resources, (9) financing of social programs, and (10) the structure and organization of education (34:1-2). Don Davies stated:

> Changing manpower trends and occupational patterns throughout the nation indicate that who will be taught will be more important to vocational educators in the next few years than what will be taught. . . . that vocational education must concentrate its efforts on youth and on individuals from minority groups and with low-income backgrounds.
>
> Two other trends are noted: Education requirements for specific occupations are rising, and so are workers' aspirations. Consequently, the less education a person has, the more difficult it will be for him to find employment in the future. What this should signal to the vocational educators is that our schools must put more effort into preventing dropouts and pay additional attention to the disadvantaged and the handicapped who most need education. (7:90)

Thus far the situation has been discussed in terms of national goals and priorities. If education is to be responsive to all youth and adult needs for personal development; local, state, and national goals must supplement and complement each other. But at the same time, unique local and state goals and priorities should not be displaced by federal domination. The common goals of Michigan's education system are grouped into four principal areas: (1) citizenship and morality, which sets out the

criteria which schools must meet in developing mature and responsible citizens; (2) democracy and equal opportunity, which deals with conditions necessary for a successful process of school operation; (3) student learning, which specifies desired outcomes for each person who is a product of our educational system; and (4) educational improvement, which identifies actions that are essential to continued upgrading of the system. Further specificity of the above goals has been set forth in the document, The Common Goals of Michigan Education (57).

In keeping with the overall goals for Michigan education, the State Board of Education has tentatively approved three major areas of thrust for the Vocational Education Services of the Michigan Department of Education. These areas are:

1. To provide facilities, programs, and an introduction to the world of work to every student in the State of Michigan.

2. To guarantee that no student entering high school in the State of Michigan leaves without having the opportunities to gain an entry level salable skill regardless of his ultimate career objective.

3. To provide programs of adult continuing education to all citizens of the state who need or desire such service.(63:1-2)

The State Vocational Education Long Range Program Plan proclaims priority needs which are presented here in abbreviated form:

(1) Providing vocational programs for those students in the sparsely populated areas of the state. . . .

(2) Providing vocational education programs for disadvantaged . . . persons.

(3) Providing vocational education programs for handicapped persons.

(4) Providing vocational education programs for those students in areas of the state considered as economically depressed, which have high rates of school dropouts and high concentrates of youth unemployment. . . .

(5) With the cooperation of the Michigan Employment Security Commission, new and emerging occupations have been identified. New career programs are being designed and implemented in the areas of personal services, marine science, public services, data processing, environmental control and hospitality and recreation occupations. (61)

Some Directions in Implementation

To implement objectives and meet priorities, there is a notable disposition within the state toward utilization of many varieties of vocational education. These include, for example, Manpower Development and Training Act programs and the JOBS Program. Such vehicles and programs have been developed to meet needs which were not being fully satisfied by established vocational programs. Increased reliance will likely fall upon private vocational education in the forms described earlier in this section for accomplishing some of these tasks. It is probable that some secondary school, post-secondary, and adult students will be able to make use of private vocational programs to meet specific individual training needs. Coupled with this is the probability of more performance contracting, with some guaranteed performance contracting possible. Although it may appear that these forms of contracting apply mainly to the services of private agencies and organizations, there is bound to be a spill-over effect upon the public vocational education program.

A further observation is that the trend toward individualization of instruction, plus increased reliance on instructional technology, will require personnel with corresponding competencies and staffing patterns of the differentiated variety.

Trends in School Population in the 1970's

Key charts and tables from a recent MEA research paper by Stanley Hecker (54) furnish a valuable profile of projected school enrollments by year and by grade from 1961/62 to 1978/79 (Appendix 3). The following conclusions are drawn regarding school enrollments for the remainder of this decade. Public and private school enrollments are combined.

1. Reflecting the reduction in number of births, early elementary (K-3) enrollments will continue to decline until mid-decade, when they are likely to rise again.

2. Later elementary (4-6) enrollments will decline through the entire decade.

3. Junior secondary enrollments will decline slightly during the first half of the decade, and then slide more sharply during the last half.

4. Senior secondary enrollments will continue to rise during the first half of the 1970's, but will decline gradually throughout the balance of the decade. They will peak in 1974/75 at a point about 7% higher than the 1970/71 level, but will decline only half that amount by decade end. Secondary vocational education enrollment can be expected to expand at no less than that of the total senior secondary population, 7% by 1975.

5. Number of secondary school finishers (post-secondary age group) will continue to expand quite markedly past the middle of the decade, after which output will decline. Of particular significance to post-secondary occupational planners is the marked increase in estimated total persons in the twenty-to twenty-nine year old age group. Hecker shows an increase of nearly 25% between 1969 and 1974, and by 1979 a rise to 47%. This presents a serious challenge which may be difficult to meet, considering present financial constraints.

Projecting Future Enrollments Composite

Projecting future enrollments is risky, at best, due to the multitude of variable factors, many of which defy identification and quantification. It is necessary, however, to attempt to predict future enrollments, since professional personnel needs are directly related to enrollments and program trends. Careful consideration of the factors and conditions discussed earlier, analysis of enrollment trends in the recent past, examination of available development plans and implementation policies, plus some deep crystal ball gazing have led to the projections appearing in Table 11 and Figure 6.

The Michigan State Plan for Vocational Education, Long Range Program Plan projects enrollments and programs for five years through 1976 (Tables 7 and 8). Table 11 was analyzed to determine the average annual enrollment change rate by program level and in aggregate (overall). The results show an aggregate increase rate of 8.8% per annum (Table 9).

A common approach to enrollment projection involves establishing a growth rate based on the record of recent past. Thus Table 10 shows increases in enrollment spanning the last ten years averaging 9.6% per annum, and the last three years averaging 7.2% per annum. These percentages are rounded at 7 and 10%, and are used to project a basis

TABLE 7.--PROJECTION OF VOCATIONAL-TECHNICAL EDUCATION ENROLLMENTS BY LEVEL AND YEAR, 1972-76.

Level of Program	Projected Enrollment				
	1972	1973	1974	1975	1976
Secondary					
Grades 9-12	120,700	123,000	136,200	153,400	186,500
Grade 8 and below	600	1,850	3,250	4,500	5,200
Post-Secondary	45,450	51,300	56,800	62,000	68,000
Adult	126,820	133,950	136,100	141,200	145,000
TOTAL	293,570	310,100	332,350	361,100	404,700
Special Programs	**1972**	**1973**	**1974**	**1975**	**1976**
Disadvantaged - TOTAL (102b and Part B)	10,928	16,300	20,500	22,500	26,200
Secondary	8,428	12,000	15,500	17,000	20,000
Post-Secondary	1,500	2,300	2,700	3,000	3,300
Adult	1,000	2,000	2,300	2,500	2,900
Handicapped - TOTAL (Part B)	2,100	2,600	3,000	3,400	3,800
Secondary	1,600	1,750	1,850	2,000	2,200
Post-Secondary	400	650	800	950	1,050
Adult	100	200	350	450	550
Cooperative Program - TOTAL (Part G Only)	1,350	1,950	2,600	3,150	3,800
Secondary	1,250	1,750	2,300	2,750	3,300
Post-Secondary	100	200	300	400	500
Adult	0	0	0	0	0
Group Guidance - TOTAL (Pre-Vocational - Parts B and D)	1,200	1,750	2,200	2,765	3,000
Work Study - TOTAL (Part H)	725	1,000	1,700	2,400	3,150
Secondary	675	900	1,500	2,100	2,750
Post-Secondary	50	100	200	300	400
Consumer & Homemaking - TOTAL (Part F)	51,200	53,500	56,700	58,900	62,000
Secondary	31,200	31,500	31,700	31,900	32,000
Post-Secondary	0	0	0	0	0
Adult	20,000	22,000	25,000	27,000	30,000

Secondary enrollments, Part B, must be added to enrollments in secondary Special Programs, Coop G, and Consumer and Homemaking Education to relate to total secondary enrollments shown elsewhere.

Source: (60)

TABLE 8.--PROJECTION OF VOCATIONAL-TECHNICAL PROGRAMS BY TYPE, NUMBER, AND ENROLLMENTS, 1972-76

Programs	1972		1973		1974		1975		1976	
	N	Enroll.	N	Enroll.	N	Enroll.	N	Enroll.	N	Enroll.
Specialized	17	5,213	23	6,380	27	22,140	31	54,700	45	103,000
Vocational-Technical Post-Secondary	0	None	0	None	0	None	0	None	0	None
Regular or Comprehensive Secondary (Consumer & Homemaking)	462	180,346 (51,200)	459	186,004 (53,500)	453	185,522 (56,700)	450	173,624 (58,900)	420	161,000 (62,000)
Junior or Community College	29	104,774	29	113,856	31	120,088	34	127,514	35	131,400
College or University	9	1,550	9	1,740	9	2,040	9	2,262	9	2,300
Secondary Post-Secondary Combination	6	1,687	7	2,120	8	2,560	9	3,000	9	3,000
Other Public Institutions	0	None	0	None	0	None	0	None	0	None
Private (under contract) 1/	3	200	5	300	8	500	12	675	14	750
Total	526	293,570	532	310,100	536	332,350	545	361,100	532	400,700

1/ Not included in tables.

Source: (60)

TABLE 9.--STATE PLAN VOCATIONAL EDUCATION ENROLLMENT PROJECTIONS BY ENROLLMENT AND ANNUAL PERCENT INCREASE.

Program Totals	1972		1973		1974		1975		1976		
	Enrollment	% Increase	Enrollment	% Increase	Enrollment	% Increase	Enrollment	% Increase	Enrollment	% Increase	Average % Increase Per Annum
TOTAL - Part B	293,570	--	310,100	5.6	332,350	7.2	361,100	8.7	404,700	12.1	8.4
TOTAL Special Programs	67,503	--	77,100	14.2	86,700	12.5	93,115	7.4	101,950	9.5	10.9
TOTAL Secondary Programs	165,653	--	174,500	5.3	194,500	11.5	216,415	11.3	254,950	17.8	11.5
TOTAL Post-Secondary Programs	42,500	--	54,550	14.8	60,800	11.4	66,650	9.6	73,250	9.9	11.4
TOTAL Adult Programs	147,920	--	158,150	6.9	163,750	3.5	171,150	4.5	178,450	4.3	4.8
Aggregate All Programs	361,073	--	387,200	7.2	419,050	8.2	454,215	8.4	506,650	11.5	8.8

TABLE 10.--ENROLLMENT IN VOCATIONAL EDUCATION CLASSES, 1961-1970: BY TYPE OF PROGRAM AND % INCREASE

Year	Agriculture	Distributive & Office	Homemaking	Trade & Industry	Technical	Total	# Increased Enrollment Over Previous Year	%
1961	16,563	16,189	56,967	44,608	5,336	139,663	1,414	1.0
1962	16,765	19,878	60,873	42,776	5,694	145,986	6,323	4.5
1963	16,099	22,353	63,879	47,691	6,292	156,314	10,328	7.5
1964	16,085	25,632	60,887	53,258	6,965	162,827	6,513	4.2
1965	15,028	28,162	73,067	56,790	6,697	179,744	16,917	10.4
1966	15,143	91,938	76,112	73,367	8,232	264,792	85,048	47.0
1967[a]	15,087	87,766	80,012	74,346	8,269	265,480	688	0.0
1968	13,930	95,228	84,848	80,697	8,930	283,633	18,153	6.8
1969	13,697	96,408	91,045	94,212	8,774	304,136	20,503	7.3
1970	14,121	98,191	96,239	100,767	9,844	326,936	22,800	7.5
					Average Increase Last Three Years			7.2
					Average Increase Over Ten Years			9.6

[a]Changes in reporting procedures accounts for unusual totals for this year.

TABLE 11.--TOTAL VOCATIONAL-TECHNICAL EDUCATION ENROLLMENT PROJECTIONS, 1970-1976

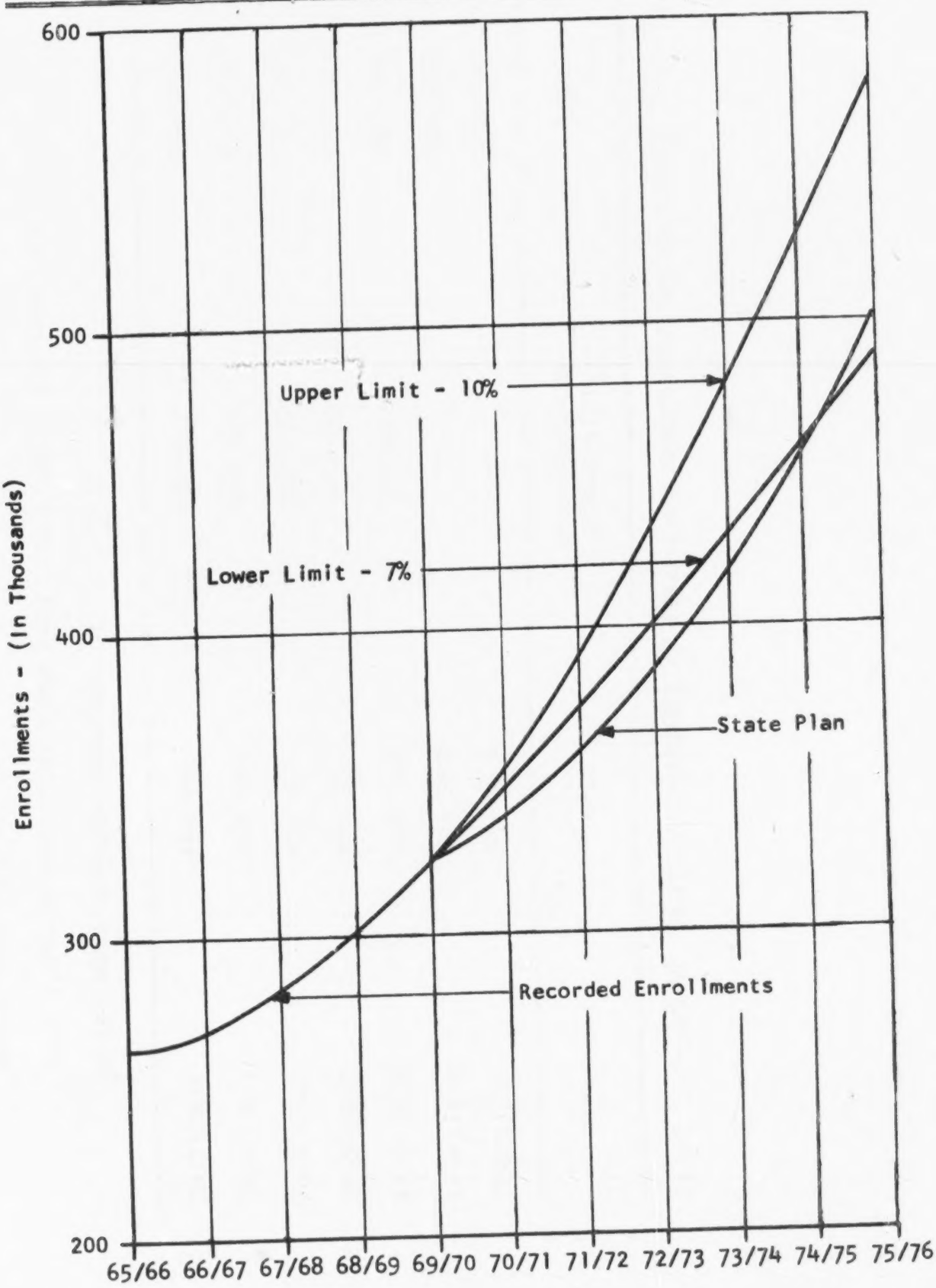
Year	7%[a]	State Plan[b] 8.8% Average	10%[c]
1969/1970	326,940	--	326,940
1970/1971	349,820	--	359,630
1971/1972	374,310	361,073	395,590
1972/1973	400,510	387,200	435,150
1973/1974	428,550	419,050	478,670
1974/1975	458,550	454,215	526,530
1975/1976	490,640	506,650	579,190

[a]Based upon average increase of 1968-1970

[b]1972-1976--projections from State Long Range Program Plan

[c]Based upon average increase of 1961-1970.

FIGURE 6.--PROJECTIONS OF TOTAL VOCATIONAL-TECHNICAL EDUCATION ENROLLMENTS



for enrollment expectations over the 1971-76 period (Table 11 and Figure 6). In addition, a third projection is plotted using the annual enrollment projections of the Long Range Program Plan through 1976, which averaged 8.8% (Table 11). In reality these estimates must be flavored with other factors, such as those discussed in previous paragraphs; for example, the mutually countering effects of bleak prospects for adequate financial resources on one hand, and on the other, continuing total secondary and post-secondary level population expansion through the period covered by this report.

These are aggregate projections and therefore do not indicate specific types or levels of programs therein. Disaggregation of these projections by secondary, post-secondary, and adult programs is accomplished in the next pages.

Prospective Development--Secondary Level

Availability of Opportunity

Secondary-level occupational programs served 28.6% of the total 9-12 enrollment in 1969/70. This constitutes a relatively static situation, since rates of 28.5% and 27.7% were posted in 1968/69 and 1967/68, respectively. This excerpt from the Area Vocational Center Plan states the situation well:

> . . . only 28 percent of Michigan's students in grades 9-12 are enrolled in vocational education. If home and family living programs are excluded, this figure is reduced to 16 percent. In other words, only one out of six students is receiving occupational preparation for gainful employment, while 75 percent of all ninth grade students enter the labor market at or before high school graduation. In addition, 27 percent of Michigan's students drop out of school before graduating; most of them with little or no job preparation. (68:2)

Another indicator of relative opportunity is the selection of occupational programs available in comprehensive high schools. Table 12 indicates that ninety-one of Michigan's 534 K-12 districts offered no reimbursed vocational education in 1968/69. These schools included 5.4% of the state secondary enrollment. Another 123 districts had only one program which served 10.3%. Nearly 30% of the secondary enrollment had none, one, or two occupational programs available to it. With the bulk of programs offered at these schools limited to agriculture and home economics, they can hardly be regarded as comprehensive secondary schools with comprehensive vocational programs.

Only seventy-one of 534 school districts offered a choice of five or more vocational areas; these schools included 43% of total secondary school enrollments. Obviously, opportunities for wider occupational program choice are better in the larger, consolidated, or metropolitan school districts, while those who live in the remote, sparsely populated areas have had relatively little opportunity for public vocational education. Realization of this situation several years ago gave rise to State of Michigan planning for area vocational centers. Once financial constraints are solved, the area center concept promises to offer wider ranges of occupational program offerings in the remote, sparsely populated areas, as well as the metropolitan areas.

Development Plans

Undoubtedly it was with lack of opportunity for vocational education in mind that the State Board of Education approved the three objectives for vocational education noted in a prior section. The second objective is especially pertinent: "To guarantee that no student entering high school in the State of Michigan leaves without having the opportunity to gain an entry-level salable skill regardless of his ultimate career objective."

This objective was translated into terminal and interim goals for 1972 and 1976 as part of the Long Range Program Plan and is included below.

TABLE 12.--NUMBER OF OCCUPATIONAL PROGRAM AREAS, SECONDARY STUDENTS AND VOCATIONAL STUDENTS BY K-12 DISTRICTS

No. of Program Areas[a]	No. of K-12 School Districts	Secondary Enrollment[b]	Per Cent	Vocational Enrollment[c]
0	91	32,145	5.4	--
1	123	61,123	10.3	11,317
2	124	73,528	12.4	22,040
3	66	63,143	10.6	18,007
4	59	107,427	18.1	25,045
5	55	140,920	23.8	49,205
6	15	42,227	7.1	13,505
7	1	72,622	12.3	21,799
TOTAL	534	593,135	100.0	160,918

[a]Agriculture, Distributive Education, Health, Home Economics, Office Occupations, Technical Education and Trade and Industrial Education.

[b]1969/70 data. [c]1968/69 data.

Source: (56).

A. Terminal Goal: To provide comprehensive occupational preparation programs within reach of every Michigan youth by 1981 in accordance with the "Tentative Plan for the Development of Area Vocational Centers in Michigan."

Interim Goals:	Current Status	1972	1976
A-1. Number of school districts with five or more vocational education program areas (Agr., DE, Health, HE, OE, and T&I) accessible to residents in their area.	*(11) 8	*(15) 12	*(43) 40
A-2. Number of school districts offering a comprehensive program (a minimum of 25 occupational instructional programs by OE Code) accessible to residents in service area in accordance with area plan.	(27) 18	(35) 25	(65) 50
A-3. Number of facilities constructed for area vocational technical centers in Michigan providing comprehensive vocational education to Michigan residents in accordance with area plan.	20	22	30
A-4. Number of school districts that are a part of a designated area center in accordance with area plan.	142	152	208

*Numbers in parentheses in A-1, A-2 . . . include non-wage earning consumer and homemaking data; numbers without parentheses reflect wage earning occupations ONLY.

Source: (61).

To implement these goals and priorities, a goal of serving 66% of secondary students by 1980/81 has been set by the State Vocational Education Services Office. Assuming that vocational programs are two years long, this means that 33% of the entire 9-12 student body would need to be enrolled in vocational education at a given time. The rate for 1969/70 was 28.6%, but when non-wage-earning home economics enrollments are excluded, the percentage is reduced to about 16%, thus indicating a target of doubling enrollments in ten years. The implications of this target in terms of enrollments were prepared by the State Vocational Education Services Office (Table 13). Explanatory comments accompanying the table are quoted below:

TABLE 13.--PROJECTED MICHIGAN ENROLLMENTS--SECONDARY VOCATIONAL EDUCATION AREA CENTERS AT K-12 DISTRICTS, 1971-80

Year	Projected Grade 9-12 Enrollment[1]	Projected Total Vocational Enrollment	Percent of 9-12 Enrollment in Vocational Ed.	Percent of 9-12 Increase in Vocational Ed.	Vocational Enrollment In Area Centers Numbers	Percent	Vocational Enrollment in K-12 Districts Number	Percent
1971-72	731,300	120,665	16.50%		6,435	.88%	114,299	15.62%
1972-73	745,600	123,024	16.50%	1.95%	7,456	1.00%	115,568	15.50%
1973-74	756,900	136,242	18.00%	10.74%	22,707	3.00%	113,535	15.00%
1974-75	767,200	153,400	20.00%	12.20%	53,704	7.00%	99,736	13.00%
1975-76	777,000	186,480	24.00%	21.53%	101,010	13.00%	85,470	11.00%
1976-77	781,600	218,848	28.00%	17.35%	128,964	16.50%	89,769	11.50%
1977-78	782,700	234,810	30.00%	7.29%	137,755	17.60%	97,055	12.40%
1978-79	778,400	241,304	31.00%	2.76%	144,782	18.60%	96,522	12.40%
1979-80	758,700	246,577	32.50%	2.18%	147,947	19.50%	98,631	13.00%
1980-81	748,200	248,776	33.25%	.89%	149,740	20.00%	99,137	13.25%

[1]Research Monograph No. 12--Michigan Department of Education

Source: (69)

Table 13 is a ten-year model showing the projected enrollment in secondary vocational education if "A Tentative Plan for the Development of Area Vocational Education Centers in Michigan" is implemented during this period. The model is designed to serve 66.5% of Michigan students entering high school. It should be noted, however, that when fully implemented, 33.25% of the grade 9-12 enrollment served at any one time will achieve the goal of 66.5% served, since most vocational education programs are offered in grades 11 and 12.

The projected total vocational enrollment (column 2) is based upon the current secondary vocational education enrollment minus Consumer and Homemaking Education.

The project program growth rate is correlated with facility development. As can be seen in column 5 the greatest growth is achieved at a mid-point in the decade. This growth pattern will require a heavy emphasis on construction in the early years of the model.

All enrollments in vocational education will occur in either area center or K-12 district programs. The fully implemented model shows area centers serving 20% of the total vocational education enrollment (column 6) and K-12 districts serving 13.25% of the total vocational education enrollment (column 7). (69)

Area vocational center expansion is intended to be the primary vehicle for carrying the projected sharp increases in enrollments. Programs at comprehensive secondary high schools will be continued, but their overall enrollment is expected to drop slightly.

Curricular Organization

Much comment has been made about the cluster-type vocational curriculum in recent years. Since qualities needed in cluster curriculum teachers vary from those needed in traditional curricula, a special point was made to determine through interview technique the extent to which actual and planned programs are moving in this direction. Taken as a whole, administrators and planners indicated interest in cluster curricula, and some deviation was noted from the highly specialized programs of the past, particularly in industrial education. More interest in cluster curriculum and action was apparent in schools having lower enrollments and sparsely populated

geographical areas to serve. Contrawise, in the metropolitan centers with larger numbers of students and more diversified programs, the tendency was to continue programs more specialized in nature. These specialized curricular patterns persist in high population density areas due to the comparative availability of full- and part-time teachers with the desired specialized competencies, better resources for equipping specialized facilities, and more placement opportunities for specialized outputs.

These observations lead to the conclusion that there is a slowly growing need for teachers and other personnel capable of functioning effectively with the cluster-type vocational curriculum, as well as a continuing need for personnel competent in more specialized curricula.

Reference to Objective I for vocational education in Michigan, "To provide an introduction to the world of work to every student in the State of Michigan," spells additional courses and experiences for large numbers of students at various levels in the K-12 districts. No doubt this goal will be sought after through a variety of approaches, one being integration of content with regular classes and another being special courses, particularly at the junior high school level. At present, plans for implementation are in the early stages; therefore they are not sufficiently advanced to be able to note specific enrollments at particular levels. Other curriculum-related matters worthy of note are the vertically integrated curriculum and the open-entry and open-exit concepts.

Enrollment Projections--
Secondary Level

Past growth records and existing development plans are two primary guides used to arrive at an estimate of future secondary-level vocational enrollments. This estimate is necessary as a basis for determining professional personnel needs.

The first estimate is an analysis of recent secondary-level enrollment changes which discloses a rate of 7.3% per annum over the latest three years for which data are available (1967-1970). Thereby a projection line of 7% annual increase is indicated as a possible line of development. Similarly, analysis of enrollment trends for vocational education as a whole during the 1960's yields an average rate of 9.6% per annum. Since the inertia of past trends has a way of persisting for some time, and since secondary enrollments account for the majority of the total, another projection line of 10% is

indicated. It is quite unlikely, however, that enrollments will vary as evenly each year as these projections would indicate. For example, total numbers of youth in high school will continue to increase, but at a slower rate, tapering off at about the midpoint of this decade and declining thereafter.

The State Long Range Program Plan indicates annual enrollment increases for five years ahead at an average rate of 11.5%, with the earlier years at a lower rate and the later years at a higher rate (61). This variation is due to the time needed to implement a stepped-up building construction program for area vocational centers and could mean much higher total vocational enrollments than those indicated by the 7% and 10% projection lines. However, this much expansion so soon is regarded as unlikely, due to financial constraints.

For purposes of this report on professional personnel needs, a range of 7% to 10% annual increment in secondary vocational enrollments is assumed and developed (Table 14 and Figure 7). It is suspected that in actual fact the enrollments will tend toward the lower end of the range in the years immediately ahead, and toward the higher end by mid-decade. It can be hoped that ways will be found to implement the financial resources needed to meet the State Plan. If this does not happen, enrollment growth is likely to be a direct function of shifts in total 9-12 school population, continuing equal to or slightly exceeding the trends shown by the MEA projections of pupil population and included as Appendix 3.

TABLE 14.--PROJECTED SECONDARY ENROLLMENTS

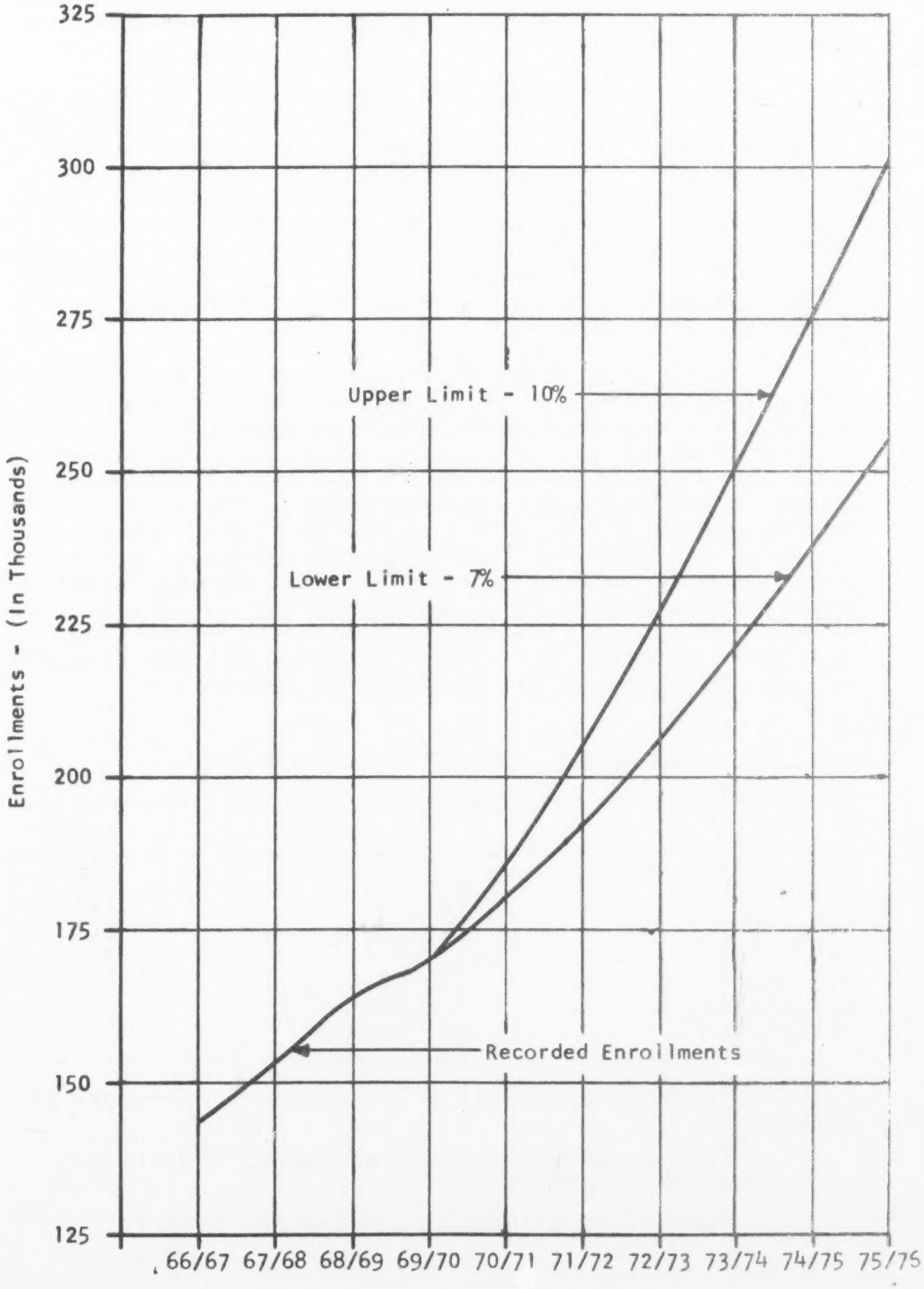
Year	7%[a]	10%[b]
1969/1970[c]	169,900	169,900
1970/1971	181,790	186,890
1971/1972	194,520	205,580
1972/1973	208,130	226,140
1973/1974	222,700	248,750
1974/1975	238,290	273,630
1975/1976	254,970	300,990

[a]Approximates annual increase over previous three years.

[b]Approximates annual increase all vocational education over previous ten years.

[c]Actual enrollments recorded for 1969/70.

FIGURE 7.--PROJECTED SECONDARY ENROLLMENTS.



Disaggregation of Secondary Enrollment Projection by Occupational Code

It is necessary to disaggregate secondary enrollment projections by occupational code in order subsequently to project quantitative teacher needs by occupational code. This is accomplished by establishing occupational field enrollment percentages for 1969/70, and then applying these percentages to the 7 and 10% annual increase enrollment projections for five years hence. This produces a range of enrollments by occupational code for each year (Table 15). An inherent weakness in this approach should be recognized, since the enrollment percentages by occupational code for 1969/70 are not likely to remain static for subsequent years, and particularly so for a span of five years. Therefore these projections need to be colored with available indices of trends, which include (1) comparative growth rates of occupational fields from the immediate past, and (2) anticipated shifts in future years.

An analysis of enrollment growth from 1966/67-1969/70 reveals average annual growth rates as listed in Table 16. These can be compared with a 2.8% average annual growth rate for the total 9-12 grade enrollment and an average annual growth rate of 7.3% for all reimbursed secondary vocational education during the same period. According to this information, health and industrial enrollment expansion rates are higher than average, while the agriculture, distributive, and office fields are lower. The home economics expansion rate equals the average. It should be recognized that the factors influencing the growth rates of the past may not exist in the future. Consequently, using past performance rate as an indicator of the future leaves much to be desired. Nevertheless, it has some value and therefore is presented.

A glimpse at the future program plans of secondary vocational program administrators is provided by the Annual and Long Range Program Plan survey made in mid-1970 by the State Vocational Education Service (Table 17). Each reimbursed K-12 district was asked to project program plans by occupational code by year for a five-year period. However, these results are incomplete, since only 77.4% of the districts responded. The survey is of significance when taken in total, since it does indicate likely directions of program expansion should adequate resources become available and other conditions become appropriate. It is important to note that these are program totals, not total

TABLE 15.--PROJECTED SECONDARY ENROLLMENT RANGE 1971/72 THROUGH 1975/76, DISAGGREGATED BY OCCUPATIONAL CODE

Occupational Code	1969/70	1971/72		1972/73		1973/74		1974/75		1975/76	
Enrollment Projection	%[a] of 169,918	Low 194,520	High 205,580	Low 208,140	High 226,140	Low 222,710	High 248,750	Low 238,300	High 273,620	Low 254,980	High 300,980
01 Agric.	7.3	14,200	15,007	15,194	16,508	16,258	13,159	17,396	19,974	18,613	21,971
04 D.E.	9.6	18,674	19,736	19,931	21,709	21,380	23,880	22,877	26,267	24,478	28,894
07 Health	1.7	3,307	3,495	3,538	3,844	3,786	4,229	4,051	4,651	4,335	5,117
09 Home Ec	45.6	88,701	93,744	94,911	103,120	101,556	113,430	108,665	124,771	116,270	137,247
14 Office	22.9	44,545	47,078	47,664	51,786	51,000	56,964	54,571	62,660	58,390	68,924
17 T&I	12.8	24,898	26,314	26,642	28,946	28,507	31,840	30,502	35,023	32,637	38,525
TOTAL [b]	99.9	194,325	205,374	207,930	225,913	222,487	248,502	238,062	273,346	254,723	300,678

[a] Percentage of 169,918 Secondary Enrollments 1969/70

[b] Errors due to rounding

TABLE 16.--SECONDARY ANNUAL ENROLLMENT CHANGE RATES 1966/67-1969/70 BY OCCUPATIONAL CODE.

Occupational Code	1966/67	1967/68		1968/69		1969/70		Average Annual Change Rate in %	Total N Change 1966/67 - 1969/70
	N	N	% Change from previous year	N	% Change from previous year	N	% Change from previous year		
01 Agric.	13,451	11,823	-12.1	11,905	6.0	12,380	3.9	-.7	-1,071
04 D.E.	14,679	15,345	4.5	16,147	5.2	16,344	1.2	3.6	1,665
07 Health	354	1,544	336.1	1,884	22.0	2,890	53.3	137.1	2,536
09 Home Ec	63,687	69,006	10.0	73,669	6.7	77,517	5.2	7.3	14,830
14 Office	34,039	39,619	16.3	40,763	2.8	38,946	-4.4	4.9	4,907
17 T&I	13,730	16,056	16.9	19,491	21.3	21,841	12.0	16.7	8,111
TOTAL	138,940	153,393	10.4	163,859	6.8	169,918	3.6	6.9	30,978

TABLE 17.--NUMBER OF SECONDARY PROGRAMS IN OPERATION AND PROJECTED THRU 1974/75 BY OCCUPATIONAL CODE.[a]

Occupational Code	1969/70		1970/71		1971/72		1972/73		1973/74		1974/75		Cumulative Increase 5 Years	Percentage Increase 5 Years
	N	%[b]	N	%	N	%	N	%	N	%	N	%	N	
01 Agric.	265	6.1	345	6.5	381	5.9	410	5.8	425	5.7	439	5.8	174	65.7
04. D.E.	1,139	26.3	1,328	25.1	1,580	24.4	1,664	23.5	1,710	23.1	1,717	22.7	578	50.7
07 Health	145	3.3	193	3.6	223	3.4	257	3.6	276	3.7	284	3.8	139	95.9
09 Home Ec	89	2.1	166	3.1	234	3.6	285	4.0	318	4.3	327	4.3	238	267.4
14 Office	1,204	27.8	1,400	26.5	1,553	24.0	1,644	23.3	1,680	22.7	1,694	22.4	490	40.7
16 Tech	3	0.0	15	.3	30	.5	39	.5	41	.5	41	.5	38	26.7
17 T&I	1,492	34.4	1,833	34.7	2,479	38.2	2,764	39.1	2,946	39.8	3,058	40.4	1,566	105.0
TOTAL	4,337	100.0	5,280	99.8	6,480	100.0	7,063	99.8	7,396	99.8	7,560	99.9	3,223	74.3

[a] Includes number of reimbursed programs operated by 368 of 483 K-12 districts (77.4% response)

[b] Percentage of total number of programs offered.

enrollment projection tables. An overall 74.3% expansion in program additions is projected, and an analysis is furnished by percentage for each occupational code (Table 17). Approximately 33% of the additions are indicated to be in business education. It is significant that nearly 50% of the total is industrial education. Since the latter programs are frequently more expensive than those in many other occupational codes, future financial constraints could shift the actual proportions significantly in favor of less expensive programs. This information, then, can be considered only an indicator of the cumulative intentions of secondary vocational administrators as to program additions in the five-year period. In summary, the Annual and Long Range Program Plan is an index of probable direction, and shows that over 80% of the new programs are intended to be in industrial and business; it follows that future secondary enrollment increases are likely to reflect the same emphases.

Prospective Development--
Post-Secondary Level

Availability of Opportunity

The availability of community college services has improved tremendously since 1960, when less than 25% of the population lived within a community college district and enrollments equaled four per 1,000 population. By 1970/71 in excess of 80% of Michigan's population lived in community college districts, and 14.3 persons per thousand were enrolled. On the other side of the ledger, however, approximately 19% of the total population plus large geographical districts were not within community college districts. In fact, as of 1969, 80% of the upper peninsula and 40% of the southern peninsula were excluded from operating community college districts. Thus the availability of opportunity in community colleges varies widely throughout the state. Occupational programs are available in some form at all of the public community colleges, but some offer only a minimal selection. According to the State Long Range Program Plan, 4% of the eighteen to twenty-four year old age group are enrolled in post-secondary vocational education, and about one-third of all post-secondary two-year student enrollments are in occupational education (61).

Development Plans

The State Long Range Program Plan for vocational education calls for doubling the number of students enrolled from approximately 35,000 to 68,000, increasing the percentage of the eighteen to twenty-four year old population enrolled in post-secondary vocational education from 4 to 6%, and increasing the percentage of post-secondary two-year students enrolled in occupational education from 31% to 46% (61). To achieve these enrollment goals, it is intended that services be expanded in accordance with the State Plan for development of area vocational centers, which intends to make area vocational center services available throughout the entire state on a secondary and post-secondary program basis within ten years. Since the number of disadvantaged and handicapped students enrolled in community college occupational education is surprisingly low, it is intended that special steps be taken to serve an increasingly significant number of special needs groups.

A recent paper on enrollment projections for public community colleges in the 1970's contains two alternative sets of projections. One follows present trends, while the other is based upon expanded emphasis and support for the two-year public community college (Table 18). The latter projection represents the shifting of an increasing proportion of enrollments from the four-year institution to the two-year institution, intending that 60% of the undergraduates enrolled in public higher education would be at the two-year colleges. Should this plan and the vocational education plan, which calls for an increased share of community college enrollments (46% by 1976), be fully implemented, exceptional expansion of occupational staff and facilities would be necessary at this level.

Enrollment Projections--
Post-Secondary Level

Analysis of past expansion rates for post-secondary education indicates an average of 16.5% per annum over the last four years (1966-70). The data covering those years reflect sharp variations from year to year, which tends to undermine confidence in the accuracy of this average. Nevertheless, a projection of future enrollments is possible, using the 16.5% per annum increase rate.

The expected average annual increase in numbers of youth of community college age for the period covered by this report is about 7%, which constitutes a base below

TABLE 18.--ENROLLMENT PROJECTIONS IN MICHIGAN HIGHER EDUCATION TO 1990

	"Present Trends" Projections				"Expanded Public Two-Year" Projections			
Year	Public Four-Year	Private	Public Two-Year	Total	Public Four-Year	Private	Public Two-Year	Total
1970	215,466	51,434	126,647	393,547	215,466	51,434	126,647	393,547
1971	222,900	54,300	145,800	423,000	222,900	54,300	145,800	423,000
1972	231,000	56,000	156,000	443,000	231,000	56,000	156,000	443,000
1973	238,200	57,800	166,000	462,000	238,200	57,800	166,000	462,000
1974	243,200	59,500	175,300	478,000	243,200	59,500	175,300	478,000
1975	246,400	61,300	184,300	492,000	246,400	61,300	184,300	492,000
1976	255,700	63,000	189,300	508,000	253,000	63,000	192,000	508,000
1977	262,600	63,000	191,400	517,000	257,200	63,000	196,800	517,000
1978	267,200	63,000	190,800	521,000	259,000	63,000	199,000	521,000
1979	271,700	63,000	190,300	525,000	260,800	63,000	201,200	525,000
1980	277,200	63,000	189,800	530,000	263,700	63,000	203,300	530,000
1981	281,700	63,000	189,300	534,000	264,500	63,000	205,500	534,000
1982	288,200	63,000	189,800	541,000	269,200	63,000	208,800	541,000
1983	294,700	63,000	190,300	548,000	272,900	63,000	212,100	548,000
1984	302,200	63,000	190,800	556,000	277,600	63,000	215,400	556,000
1985	310,600	63,000	192,400	566,000	283,100	63,000	219,900	566,000
1986	322,500	63,000	194,500	580,000	294,700	63,000	222,300	580,000
1987	332,900	63,000	197,100	593,000	304,700	63,000	225,300	593,000
1988	345,100	64,800	202,100	612,000	316,300	64,800	230,900	612,000
1989	361,600	66,600	212,800	641,000	331,200	66,600	243,200	641,000
1990	384,500	68,300	227,200	680,000	352,100	68,300	259,600	680,000

Source: (72)

which occupational enrollments are not likely to fall. A somewhat higher average annual expansion rate of 10% was selected, since an increasing proportion of total enrollments is expected to opt for occupational education. Thus, an average annual growth rate range of 10% low and 16.5% high was selected for projection through 1976 (Table 19 and Figure 8). The State Long Range Program Plan projection, which approximates 11% per year for the five-year period, is also included in Table 19.

Disaggregation of Post-Secondary Enrollment Projection by Occupational Code

As with secondary enrollment projections, it is necessary to disaggregate post-secondary enrollment projections by occupational code in order subsequently to project quantitative teacher needs by occupational specialties. This is accomplished by establishing occupational code enrollment percentages for 1969/70, and then applying these percentages to the 10 and 16.5% enrollment projections for five years. This produces a range of enrollments by occupational code for each year (Table 20). An inherent weakness in this approach should be noted, since the enrollment percentages by occupational code for 1969/70 are not likely to remain static for subsequent years, and particularly for a five-year span. Therefore, these projections also need to be adjusted with available indices of trends, which include (1) comparative growth rates of occupational fields from the immediate past, and (2) anticipated shifts of future years.

The analysis of enrollment growth from 1966/67-1969/70 can be compared to the average annual growth rates of 10% for all reimbursed post-secondary vocational-technical enrollments during the same period (Table 21). According to this information, trade and technical enrollment growth rates were most significant, with agriculture and home economics also showing high rates, although relatively small quantities are involved in the latter two fields. Health and office were below the average, while distributive registered an overall declining rate. It must be recognized that the same combination of factors which influenced these growth rates in the past is not likely to prevail in the future. Therefore, using past performance rates as an index of the future should be applied with discretion.

TABLE 19.--PROJECTED POST-SECONDARY ENROLLMENTS.

Year	10%[a]	16.5%[b]	State Long[c] Range Plan
1969/70[d]	35,000	35,000	
1970/71	38,500	40,770	
1971/72	42,350	47,500	47,500
1972/73	46,580	55,340	54,550
1973/74	51,240	64,460	60,800
1974/75	56,370	75,100	66,650
1975/76	62,000	87,500	73,250

[a]Approximate annual increase in post-secondary over previous 3 years.

[b]Annual increase in post-secondary over previous 4 years.

[c]Long Range Program Plan projections, including special programs.

[d]Actual enrollments recorded for 1969/70, including occupational education enrollments at 4 year colleges.

FIGURE 8.--PROJECTED POST-SECONDARY ENROLLMENTS.

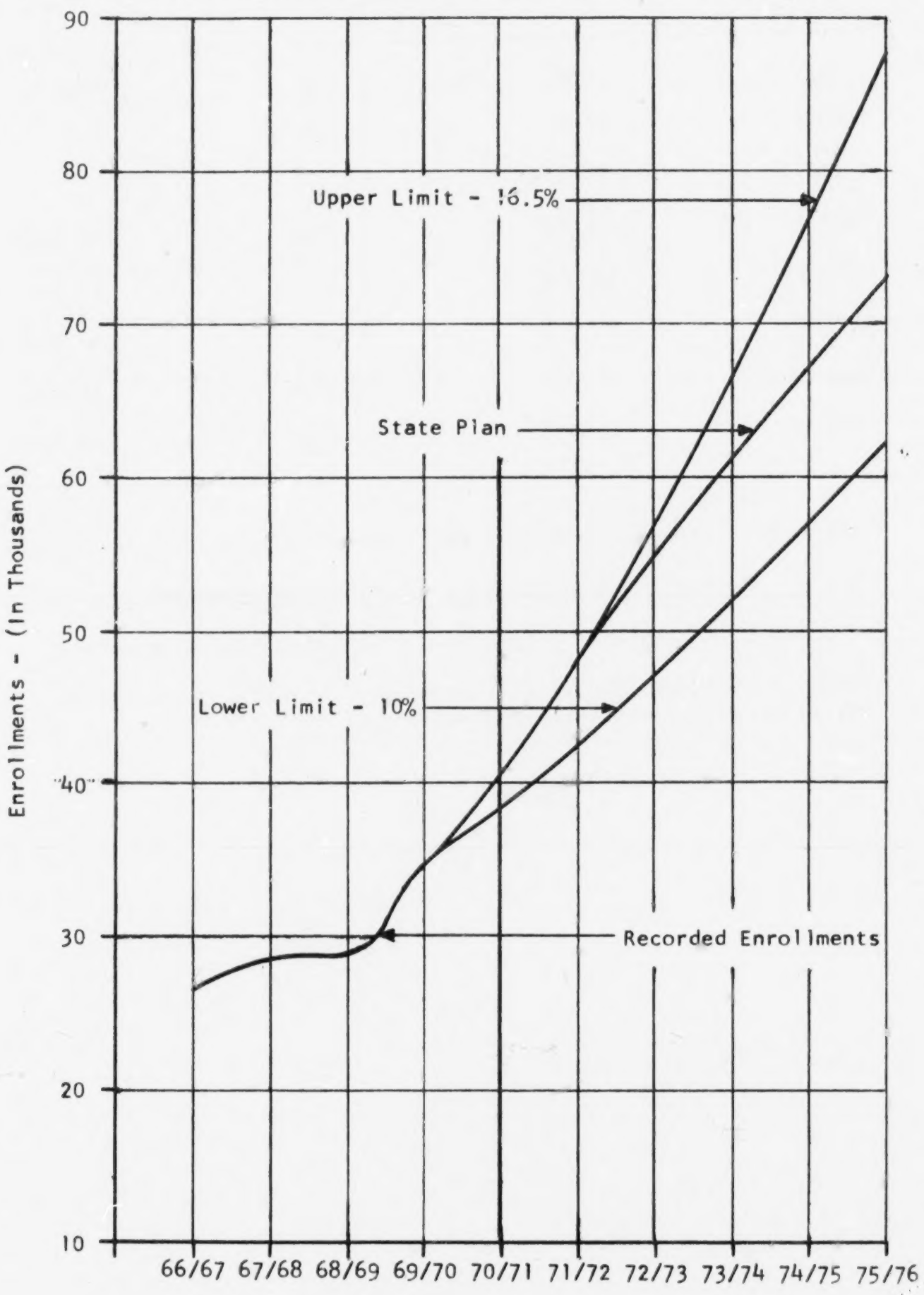


TABLE 20.--PROJECTED POST-SECONDARY ENROLLMENT RANGE, 1971/72 THRU 1975/76, DISAGGREGATED BY OCCUPATIONAL CODE.

Occupational Code	1969/70	1971/72		1972/73		1973/74		1974/75		1975/76	
Enrollment Projection	%[a] of 34,954	Low 42,350	High 47,500	Low 46,580	High 55,340	Low 51,240	High 64,470	Low 56,360	High 75,110	Low 62,000	High 87,500
01 Agric.	2.0	847	950	932	1,107	1,025	1,289	1,127	1,502	1,240	1,750
04 D.E.	8.1	3,430	3,847	3,773	4,482	4,150	5,222	4,565	6,084	5,022	7,087
07 Health	11.3	4,785	5,367	5,263	6,253	5,790	7,285	6,369	8,487	7,006	9,887
09 Home Ec	.7	296	332	326	387	359	451	394	526	434	612
14 Office	30.7	13,001	14,582	14,300	16,989	15,731	19,792	17,302	23,059	19,034	26,862
16 Tech	22.1	9,359	10,497	10,294	12,230	11,324	14,248	12,455	16,599	13,702	19,337
17 T&I	24.9	10,545	11,827	11,598	13,780	12,759	16,053	14,034	18,702	15,438	21,787
TOTAL[b]	99.8	42,263	47,402	46,486	55,228	51,138	64,340	56,246	74,959	61,876	87,322

[a] Percentage of 34,954 Post-Secondary Enrollments 1969/70

[b] Errors due to rounding

TABLE 21.--POST-SECONDARY ANNUAL ENROLLMENT CHANGE RATES 1966/67-1969/70 BY OCCUPATIONAL CODE.

Occupational Code		1966/67	1967/68		1968/69		1969/70		Average Annual Change Rate in %	Total N Change 1966/67 - 1969/70
		N	N	% Change from previous year	N	% Change from previous year	N	% Change from previous year		
01	Agric.	418	571	36.6	547	-4.2	704	28.7	20.4	286
04	D.E.	3,832	3,359	-12.3	2,683	-20.1	2,847	6.1	-8.8	-985
07	Health	3,824	3,100	-18.9	3,332	7.4	3,968	19.0	2.5	144
09	Home Ec	12	7	-41.6	191	2,628.5	262	37.1	874.7	250
14	Office	10.669	9,679	-9.2	9,070	-6.2	10,728	18.2	.9	59
16	Tech	4,117	6,384	55.0	5,728	-10.2	7,739	35.1	26.6	3,622
17	T&I	3,530	5,436	53.9	7,330	34.8	8,706	18.7	35.8	5,176
	TOTAL	26,402	28,536	8.1	28,881	1.2	34,954	21.0	10.1	8,552

A summary of the Annual and Long Range Program Plan survey made in mid-1970 by the State Vocational Education Services office provides a view of the future program additions made by post-secondary vocational-technical program administrators (Table 22). The survey is of considerable significance when taken as a whole, since it does indicate likely directions of program expansion. Note, however, that these results are incomplete, with only 62.5% of the units responding. When examining this table it is important to note that these are program totals, which furnish an analysis of additions by percentage for each occupational code, not enrollment projection totals. It is significant that approximately 85% of the total is Trade and Technical, with all others accounting for 2 to 6% each. When combined, distributive and office total 9%. The Annual and Long Range Program Plan can be considered only as a broad and incomplete index of the cumulative intentions of post-secondary vocational-technical administrators as to desired program additions in the five-year period. Actual future program additions and enrollments are likely to reflect these projections to a substantial extent.

Prospective Development--Adult Occupational Education

Availability of Opportunity

Adult occupational education programs were administered by 106 or 17% of the school districts in 1969/70. It is claimed that approximately 1 to 2% of the available adult population was enrolled in adult occupational education during 1969/70. Table 23 pictures enrollment figures and program types for 1969/70 as administered through State Vocational Education Services office. It should be made clear, however, that there are several major adult vocational programs available in Michigan, which are not included in these totals.

Development Plans

The State Long Range Program Plan projects an increase in preparatory and supplementary adult enrollments from approximately 122,000 to 178,000 by 1976. This amounts to an average increment rate of approximately 5% per annum, slightly lower than the average growth rate of 7% for the period 1966/67 through 1969/70. Of special interest is the intent to place responsibility for adult education with community colleges, utilizing the facilities

TABLE 22.--NUMBER OF POST-SECONDARY PROGRAMS IN OPERATION 1969/70 AND PROJECTED THRU 1974/75 BY OCCUPATIONAL CODE.[a]

Occupational Code		1969/70		1970/71		1971/72		1972/73		1973/74		1974/75		Cumulative Increase 5 Years	Percentage Increase 5 Years
		N	%[b]	N	%	N	%	N	%	N	%	N	%	N	
01	Agric.	6	3.4	9	2.0	8	2.2	8	2.1	8	2.1	8	2.0	2	33.3
04	D.E.	5	2.85	15	3.3	11	3.0	11	2.9	11	2.8	11	2.7	6	120.0
07	Health	3	1.7	11	2.4	8	2.2	8	2.1	8	2.1	8	2.0	5	166.7
09	Home Ec	1	.6	8	1.7	9	2.5	9	2.3	9	2.3	9	2.2	8	800.0
14	Office	5	2.85	36	7.9	22	6.1	22	5.7	22	5.7	23	5.6	18	360.0
16	Tech	117	66.85	269	59.0	229	63.4	245	64.0	247	63.8	264	64.9	147	125.6
17	T&I	38	21.7	108	23.7	74	20.5	80	20.9	82	21.2	84	20.6	46	121.1
	TOTAL	175	99.95	456	100.0	361	99.9	383	100.0	387	100.0	407	100.0	232	132.6

[a]Includes number of reimbursed occupational programs operated by 21 of 29 community colleges and 3 of 10 four-year colleges (62.5% response)

[b]Percentage of total number of programs offered.

TABLE 23.--ADULT VOCATIONAL ENROLLMENTS BY OCCUPATIONAL CODE AND PROGRAM, 1969/70

	Programs	Apprenticeship	Adult Preparatory	Adult Supplemental
01	Agriculture	18	136	813
04	Distributive Education	3	2,148	40,286
07	Health		110	806
09	Home Economics		113	18,293
14	Office Education	21	4,093	6,535
16	Technical	3	168	1,934
17	Trade and Industry	20,686	3,588	46,029
	TOTAL	20,731	10,356	114,696

Source: (69)

of both secondary and post-secondary units in accomplishing the goal. It is planned that all of the secondary area vocational centers will be utilized.

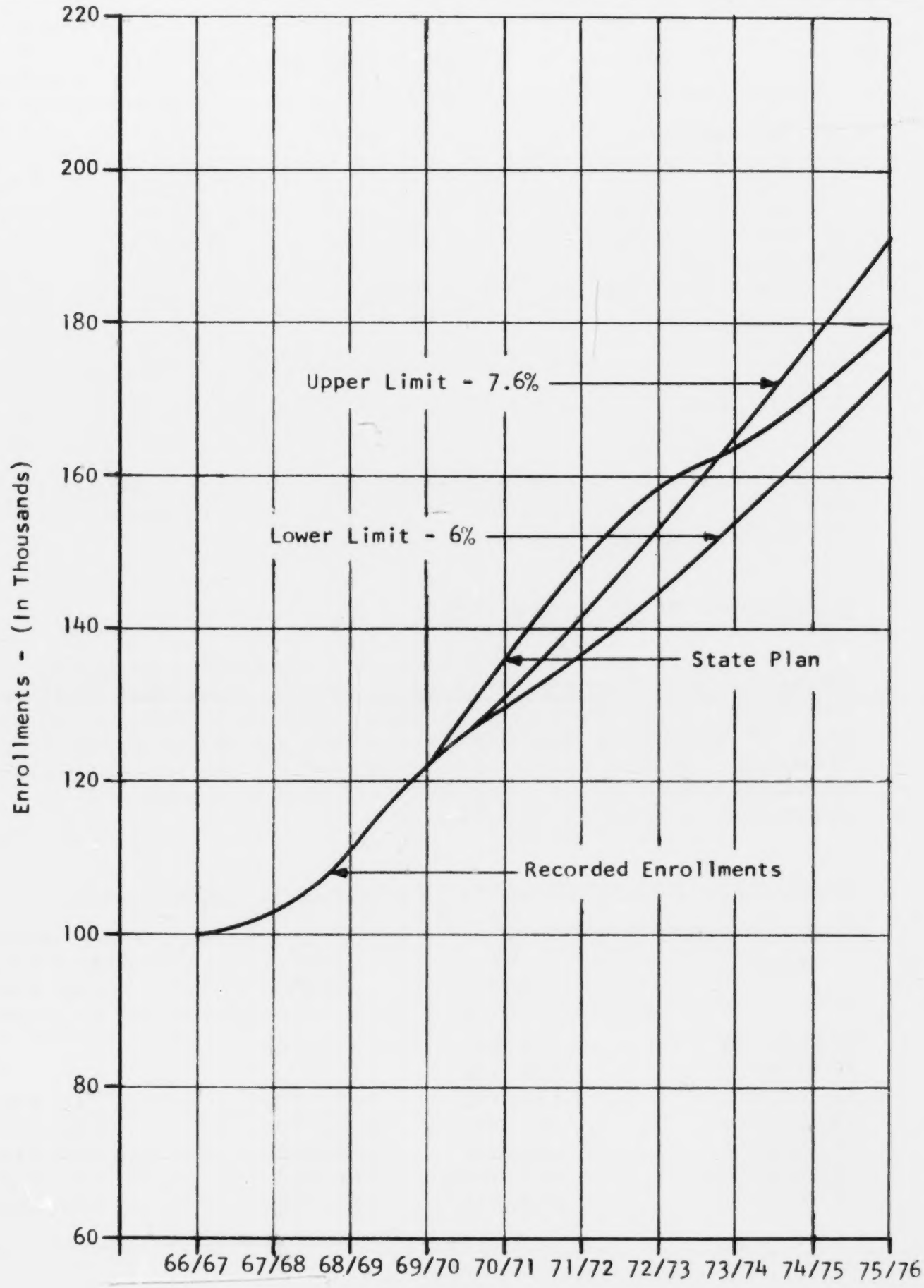
Enrollment Projections--Adult

It is anticipated that the expansion rate for adult education enrollments will be somewhat less than that of the overall vocational-technical education growth rate and that of secondary and post-secondary programs taken individually. A low range of approximately 6% increase and an upper range of approximately 7.6% per annum are projected (Table 24 and Figure 9).

TABLE 24.--PROJECTED ADULT OCCUPATIONAL ENROLLMENTS

Year	6% Low	7.6% High	State Long Range Plan
1969/1970	122,040	122,040	
1970/1971	129,530	131,970	
1971/1972	137,440	142,510	147,920
1972/1973	145,800	153,670	158,150
1973/1974	154,610	165,460	163,750
1974/1975	163,890	177,800	171,150
1975/1976	173,670	190,700	178,450

FIGURE 9.--PROJECTED ADULT OCCUPATIONAL ENROLLMENTS.



Disaggregation of Adult Enrollment Projection by Occupational Code

Again it is necessary to disaggregate adult enrollment projections by occupational code in order subsequently to project quantitative teacher needs by occupational specialties. This is accomplished by establishing enrollment percentages by occupational code for 1969/70, and then applying these percentages to the 6 and 7.6% enrollment projections for five years hence. This produces a range of enrollments by occupational code for each year (Table 25). An inherent weakness in this approach should again be recognized, since the enrollment percentages by occupational code for 1969/70 are not likely to remain static for subsequent years, and particularly so for a five-year span. These projections need also to reflect (1) comparative growth rates of occupational fields from the immediate past, and (2) anticipated shifts of future years.

An analysis of enrollment growth from 1966/67-1969/70 reveals average annual growth rates, as listed in Table 26, which can be compared with an average annual growth rate of 7% for all reimbursed adult vocational-technical enrollments during the same period. According to this information, health, office, and trade and industrial enrollment growth rates are above average, while distributive, home economics, agriculture, and technical are lower than average, with the latter two posting declining rates. Whether or not these trends from the immediate past will prevail in the future and thus serve as an index, is open to question. Past trends do carry the weight of inertia, however, and can be expected to persist to some extent.

No index of future program plans and enrollment by occupational code for adult vocational-technical education was located.

Summary of Enrollment Projections

The overall enrollment projections for vocational-technical education (Table 11) have been disaggregated by secondary, post-secondary, and adult education programs. These parts are now regrouped and combined for comparison purposes (Table 27). The same overall enrollment projections (Table 11) have been further analyzed by occupational code for secondary, post-secondary, and adult education programs. These separate projections are now combined or aggregated to illustrate total enrollment projections by occupational code (Table 28).

TABLE 25.--PROJECTED ADULT ENROLLMENT RANGE, 1971/72 THRU 1975/76, DISAGGREGATED BY OCCUPATIONAL CODE.

Occupational Code	1969/70	1971/72		1972/73		1973/74		1974/75		1975/76	
Enrollment Projection	% [a] of 122,064	Low 137,440	High 142,510	Low 145,800	High 153,670	Low 154,610	High 165,460	Low 163,890	High 177,800	Low 173,670	High 190,700
01 Agric.	.8	1,099	1,140	1,166	1,229	1,237	1,324	1,311	1,422	1,389	1,526
04 D.E.	15.3	21,028	21,804	22,307	23,511	23,655	25,315	25,075	27,203	26,571	29,177
07 Health	.7	962	997	1,021	1,076	1,082	1,158	1,147	1,245	1,216	1,335
09 Home Ec	15.1	20,753	21,519	22,016	23,204	23,346	24,984	24,747	26,848	26,224	28,796
14 Office	8.7	11,957	12,398	12,685	13,369	13,451	14,395	14,258	15,469	15,109	16,591
16 Tech	1.7	2,336	2,422	2,479	2,612	2,628	2,813	2,786	3,023	2,952	3,242
17 T&I	57.6	79,165	82,086	83,981	88,514	89,055	95,305	94,401	102,413	100,033	109,843
TOTAL [b]	99.9	137,300	142,366	145,655	153,515	154,454	165,294	163,725	177,623	173,494	190,510

[a]Percentage of 122,064 Adult Enrollments 1969/70

[b]Errors due to rounding

TABLE 26.--ADULT ANNUAL ENROLLMENT CHANGE RATES 1966/67-1969/70 BY OCCUPATIONAL CODE.

Occupational Code	1966/67	1967/68		1968/69		1969/70		Average Annual Change Rate in %	Total N Change 1966/67 - 1969/70
	N	N	% Change from previous year	N	% Change from previous year	N	% Change from previous year		
01 Agric.	1,218	1,536	26.1	1,245	-18.9	1,037	-16.7	-3.2	-181
04 D.E.	18,677	19,932	6.7	19,127	-4.0	18,677	-2.3	.1	0
07 Health	514	747	45.3	1,028	37.6	916	-10.8	24.0	402
09 Home Ec	17,313	15,835	-8.5	17,185	8.5	18,460	7.4	2.5	1,147
14 Office	5,870	7,294	24.2	8,618	18.1	10,649	23.5	21.9	4,779
16 Tech	3,863	2,546	-34.0	3,046	19.6	2,105	-30.9	-15.1	-1,758
17 T&I	52,394	53,814	27.1	61,147	13.6	70,220	14.8	18.5	17,826
TOTAL	99,849	101,704	1.9	111,396	9.5	122,064	9.6	7.0	22,215

TABLE 27.--ANNUAL ENROLLMENT PROJECTION RANGES 1969/70-1975/76 BY SECONDARY, POST-SECONDARY, AND ADULT.

Year	Secondary		Post-Secondary		Adult		Composite	
	Low 7%	High 10%	Low 10%	High 16.5%	Low 6%	High 7.6%	Low	High
	Base		Base		Base		Base	
1969/70	169,900		35,000		122,040		326,940	
1970/71	181,790	186,890	38,500	40,770	129,530	131,970	349,820	359,630
1971/72	194,520	205,580	42,350	47,500	137,440	142,510	374,310	395,590
1972/73	208,130	226,140	46,580	55,340	145,800	153,670	400,510	435,150
1973/74	222,700	248,750	51,240	64,460	154,610	165,460	428,550	478,670
1974/75	238,290	273,630	56,370	75,100	163,890	177,800	458,550	526,530
1975/76	254,970	300,990	62,000	87,500	173,670	190,700	490,640	579,190

TABLE 28.--ANNUAL ENROLLMENT CHANGE RATES FOR ALL VOCATIONAL-TECHNICAL EDUCATION 1966/67-1969/70.

Occupational Code		1966/67	1967/68		1968/69		1969/70		Average Annual Change Rate in %	Total N Change 1966/67 - 1969/70
		N	N	% Change from previous year	N	% Change from previous year	N	% Change from previous year		
01	Agric.	15,087	13,930	-7.7	13,697	-1.7	14,121	3.1	-2.1	-966
04	D.E.	37,188	38,636	3.9	37,957	-1.7	37,868	-.2	.6	680
07	Health	4,692	5,391	14.9	6,244	15.8	7,774	24.5	18.4	3,082
09	Home Ec	80,014	84,848	6.0	91,045	7.3	96,239	5.7	6.3	16,227
14	Office	50,578	56,592	11.9	58,451	3.3	60,323	3.2	6.1	9,745
16	Tech	7,980	8,930	11.9	8,774	-1.7	9,844	12.2	7.4	1,864
17	T&I	69,654	75,306	8.1	87,968	16.8	100,767	14.5	13.1	31,113
	TOTAL	265,191	283,633	6.9	304,136	7.2	326,936	7.5	7.2	61,745

Summary

Recent and prospective development of vocational-technical education in Michigan has been examined in this Section. First, the system of vocational-technical education was described in terms of organization, programs, enrollments, and responsibility. Next, factors likely to have a bearing on the rate of expansion were described. Enrollments by year through 1975/76 were then projected for secondary, post-secondary, and adult vocational-technical education. These annual enrollment projections were disaggregated by occupational fields, thus forming the basis for estimating the quantities of teachers, administrators, and other personnel needed in future years.

SECTION III

SUPPLY OF PERSONNEL

Basic to identifying occupational education personnel problems of the 1970's is an investigation of the characteristics of current stocks, sources, existing training systems, and probable outputs of personnel.

Since the focus of this investigation was determined to include most kinds of personnel engaged in the vocational-technical education enterprise, a functional classification system had to be devised. This was determined to be (1) teacher and teacher/coop coordinator, (2) administrator/supervisor/director, (3) consultant/specialist, (4) guidance and placement worker, (5) researcher, and (6) paraprofessional. Similarly, a pattern for classifying employer types or agencies had to be developed, and this was determined to include (1) local K-12 district, (2) intermediate district, (3) community college, (4) university and four-year college, and (5) State Office. As a result, a two-dimensional personnel and employer grid was established to guide this investigation (Figure 10).

Information descriptive of the existing stocks of personnel is presented next, and is organized by employer types with personnel types being discussed within.

Existing Stocks of Personnel

No such item as a comprehensive inventory of existing stocks of Michigan vocational-technical education personnel was found, although such would be highly desirable, in fact necessary, for sound planning. Much time and effort were expended to assemble a comprehensive inventory, but the best that could be done under the circumstances was to locate existing data, attempt to cover certain voids with original research, and to integrate the findings for presentation herein. Personnel counts are necessary, but insufficient in themselves, since knowledge of professional qualities or characteristics is at least as important. It was at this point that most of the gaps were found to exist. Recommendations for establishment of a functional inventory of existing personnel are included in Section V of this report.

FIGURE 10.--PERSONNEL AND EMPLOYER GRID--FOR PROGRAMS IN VOCATIONAL-TECHNICAL EDUCATION

Personnel	Employer				
	Local K-12 District	Intermediate District	Community College	University & 4 Yr. Coll.	State Office
Teacher/Teacher Coordinator					
Administrator/ Supervisor					
Consultant/ Specialist -Curriculum -Instructional Materials Development					
Guidance and Placement Personnel					
Researcher					
Paraprofessional -Instructional -Service					

Compiling an up-to-date inventory of quantities of vocational education teachers was accomplished by synthesizing annual reports sent to the United States Office of Education. Tables 29 and 30 present quantities of secondary, post-secondary, and adult program teachers by occupational area for a five-year span. These reports are based on the annual vocational reimbursement contracts, and therefore only include teachers engaged in reimbursed vocational-technical programs. It is significant that the number of health teachers has nearly tripled in the five years covered, and that the group of agriculture teachers has shrunken slightly. Perhaps of even more importance is the dominance by part-time teachers. Most part-timers at the secondary level are regularly qualified personnel not fully engaged in teaching reimbursed vocational classes, but who fill out their schedules with other teaching and supervisory duties. Part-timers at the post-secondary level are likely to be employed elsewhere on a full-time basis.

Secondary Personnel

Teachers and Teacher Coordinators

A quantitative record of secondary vocational teachers (reimbursed) from 1966 through 1970, by occupational code and full-time/part-time employment status (Table 31) is of interest in that part-time teachers exceeded full-timers each year and that the differential has widened, that the number of full-time teachers has shrunken while the quantity of part-timers has increased substantially. These changes may reflect changes in reimbursement or accounting regulations, and/or they may indicate a trend toward less than full-time utilization of regular faculty in their prime occupational fields.

An inventory of vocational and practical arts personnel functioning in Michigan secondary schools during 1970/71 (Table 32) summarizes the latest available count of teaching personnel but cannot be directly compared with data in Table 31, since it is determined on a different basis.

A silhouette of vocational teaching certification by occupational code (Table 33) presents a discrepancy between these numbers and those of Table 32, which may be due to duplicate qualifications and assignments, or the inclusion of some administrative types. This is but illustrative of the form of difficulty which continually

TABLE 29.--NUMBER OF TEACHERS IN REIMBURSED VOCATIONAL EDUCATION PROGRAMS BY OCCUPATIONAL CODE, FISCAL YEARS 1966-1970

Type of Program	1966	1967	1968	1969	1970
01 Agriculture	261	235	232	220	234
04 Distributive Education	551	820	670	645	653
07 Health	128	179	309	357	410
09 Home Economics	1051	1066	1115	1125	1247
14 Office	937	1150	1117	1016	1241
16 Technical	257	330	364	402	441
17 Trade and Industry	1523	1693	2121	2082	2417
TOTAL, Unduplicated	4708	5473	5928	5847	6643

Source: Michigan Department of Education, Vocational Education Services Files, O.E. Form 3136

TABLE 30

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

BUDGET BUREAU NO. 51-R084
APPROVAL EXPIRES 3/31/71

NUMBER OF TEACHERS AND STATUS OF TEACHER TRAINING IN VOCATIONAL EDUCATION

Read instructions on reverse before completing this form

STATE/OUTLYING AREA: Michigan

DATE PREPARED: 10/9/70

FISCAL YEAR ENDING: June 30, 19 70

REPORT DUE: October 1, 1970

VOCATIONAL PROGRAMS	TOTAL UNDUPLICATED	NUMBER OF TEACHERS									NUMBER OF ENROLLEES IN TEACHER TRAINING		NUMBER COMPLETING STATE PLAN REQUIREMENTS	
		SECONDARY*			POSTSECONDARY			ADULT						
		FULL-TIME	PART-TIME	TEACHER AIDES	FULL-TIME	PART-TIME	TEACHER AIDES	FULL-TIME	PART-TIME	TEACHER AIDES	PRE-SERVICE	IN-SERVICE	PRE-SERVICE	IN-SERVICE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. TOTAL, UNDUPLICATED	6643	1119	1704	NA	847	754	NA	226	2598	NA	3488	1854	940	314
SPECIAL PROGRAMS:														
2. EXEMPLARY														
3. GROUP GUIDANCE														
4. PRE-POSTSECONDARY														
5. REMEDIAL														
6. COOPERATIVE, PART G														
7. DISADVANTAGED														
8. HANDICAPPED														
REGULAR OCCUPATIONAL PROGRAMS (Specify by OE Code)														
9. 01. AGRICULTURE	234	73	124	0	21	14	0	0	45*	0	74	126	34	13
10. 04. DISTRIBUTION	653	113	149	NA	42	34	NA	22	324	NA	408	154	111	18
11. 07. HEALTH	410	22	10	NA	228	108	NA	3	43	NA	2	52	2	15
12. 09.01 COMPREHENSIVE HOMEMAKING	1130	340	506	0	0	0	0	0	297	0	1196	520	316	75
13. 09.02 OCCUPATIONAL PREPARATION	117	41	82	0	7	25	0	0	2	0	0	0	0	0
14. 14. OFFICE	1241	301	473	NA	118	174	NA	23	361	NA	1188	523	340	55
15. 16. TECHNICAL	441	0	0	0	177	207	0	6	153	0	119	50	19	13
16. 17. TRADES AND INDUSTRY	2417	229	360	NA	254	192	NA	172	1373	NA	501	429	118	125
17. OTHER (Specify)														

Information for lines 2-8 is not available since it was not known that this information was needed at the time our state forms were prepared

*Indicate in item 9 on the appropriate lines the number of elementary teachers.

*43 of 45 included in full-time teacher count in column 3

OE FORM 3136, 6/70 REPLACES OE FORM 4047-1, 2/69, WHICH IS OBSOLETE

TABLE 31.--NUMBER OF TEACHERS IN REIMBURSED SECONDARY VOCATIONAL EDUCATION PROGRAMS BY OCCUPATIONAL CODE: STATE OF MICHIGAN, FISCAL YEARS 1966 to 1970

Type of Program	1966			1967			1968			1969			1970		
	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time
01 Agric.	236	222	14	216	206	10	210	199	11	194	185	9	197	73	124
04 D.E.	266	17	249	292	28	264	377	26	351	405	19	386	262	113	149
07 Health	4	4	0	34	22	12	75	50	25	40	28	12	32	22	10
09 Home Ec	678	661	17	705	705	0	820	820	NA*	859	859	0	969	381	588
14 Office	811	18	793	751	29	722	825	18	807	871	19	852	774	301	473
16 Tech	0	0	0	10	9	1	0	0	0	0	0	0	0	0	0
17 T&I	392	270	122	492	169	323	503	182	321	469	217	252	589	229	360
TOTAL	2,387	1,192	1,195	2,500	1,168	1,332	2,810	1,295	1,515	2,838	1,327	1,511	2,823	1,119	1,704

*NA - No information available

Source: Michigan Department of Education, Vocational Education Files, OE Form 3136

TABLE 32.--QUANTITIES OF SECONDARY VOCATIONAL AND PRACTICAL ARTS TEACHERS BY SUBJECT AREA FOR 1970/71

Vocational Occupational Area	N	Practical Arts Subject	N
01 Agriculture	193	Agriculture	32
04 D.E.	304	Business	2,640
07 Health	8	Home Ec.	839
09 Home Ec.	1,267	Industrial Arts	2,750
14 Office	844		
17 T&I	747		
TOTAL	3,130[a]		6,261

[a]Discrepancy in total due to persons holding qualifications in more than one area (i.e., D.E. & O.E.)

Source: Annual K-12 Professional Personnel Register and Vocational Certification File.

TABLE 33.--QUANTITIES OF VOCATIONALLY CERTIFIED PERSONNEL TEACHING IN MICHIGAN SECONDARY SCHOOLS BY OCCUPATIONAL AREA AND BY TYPE OF CERTIFICATE, 1970/71

Occupational Area	Vocational Secondary Provisional	Vocational Secondary Permanent	Vocational Special	Life	Total
01 Agriculture	64	141	0	5	210
04 D.E.	218	103	0	0	321
07 Health	6	0	0	0	6
09 Home Economics	740	482	3	41	1,266
14 Office	602	191	0	1	794
17 T&I	529	161	5	0	695
TOTAL	2,159	1,078	8	47	3,292

Source: Vocational Certification File on Annual K-12 Professional Personnel Register.

frustrated efforts to define accurately current personnel stocks. A detailed analysis of Table 33 by occupational code and certificate type is presented in Appendix 4.

Of special note is the information that the number of provisional certificate holders is double the number of permanent certificate holders. It was certainly unexpected to find only eight "Special" certificate holders, since a large number are issued each year (1,013 in 1969/70). It may be that the vast majority of "Specials" are part-timers teaching adult classes.

A more complete analysis of the characteristics of secondary personnel appears as Tables 34, 35, and 36, which cover information as to type of certificate held,* highest degree earned, institution granting degree, teaching experience, average age, and average salary. Table 35 covers vocational personnel, while Table 36 includes practical or applied arts teachers. These individuals were identified by combining the annual K-12 Register of Professional Personnel of the Michigan Department of Education with the vocational teacher certificate file. This represents a significant advancement in integrating existing teacher data, which until recently was kept separately by two departments in the State Department of Education, and provides a glimpse of steps currently being taken within the Department of Education to merge records and furnish more complete personnel data.

Administrators/Supervisors/ Directors

There were seventy-four reimbursed vocational education administrators at the secondary level, consisting of sixty-one local directors and thirteen area center principals. Six local directors doubled as area vocational center administrators. An additional two full-time and two part-time administrative interns were engaged during 1970/71.

---

*Due to information collection procedures, these certificate data cannot be considered to be an accurate picture of vocational certificates held. Rather, they tend to indicate general teaching certificates held. Consult Table 33 instead.

TABLE 34.--PROFILES OF VOCATIONAL AND PRACTICAL ARTS PERSONNEL, ACTIVE FALL 1970

VOCATIONAL INSTRUCTORS

	MALE	FEMALE	TOTAL
NUMBER REPORTING	1,260	1,870	3,130
AVERAGE SALARY	11,927	10,651	11,165
AVERAGE EXPERIENCE--YEARS	9	8	8
AVERAGE AGE	34	33	33

Institution Granting Degree	Number	Percent
Central Michigan University	241	7.70
Eastern Michigan University	265	8.47
Ferris State College	158	5.05
Michigan State University	665	21.25
Northern Michigan University	154	4.92
University of Michigan	106	3.39
Wayne State University	414	13.23
Western Michigan University	454	14.50
Adrian College	7	.22
Albion College	8	.26
Alma College	4	.13
Aquinas College		.00
Calvin College		.00
Andrews University	6	.19
Hillsdale College	4	.13
Hope College	1	.03
Kalamazoo College		.00
Madonna College	1	.03
Marygrove College	11	.35
Mercy College	4	.13
Nazareth College		.00
Olivet College		.00
Siena Heights College	5	.16
University of Detroit	26	.83
Spring Arbor College	1	.03
Grand Valley State College	1	.03
Out-of-State and Foreign	570	18.21
	3,130	

Type of Certificate	Number	Percent
Elementary Provisional	4	.13
Elementary Permanent	9	.29
Secondary Provisional	1,218	38.91
Secondary Permanent	1,473	47.06
Life	146	4.66
Full Year Permit	48	1.53
State Limited	5	.16
County Limited	1	.03
Prov. or Perm. Pending	105	3.35
Not Reported	121	3.87
	3,130	

Highest Degree	Number	Percent
Bachelors	1,866	59.62
Masters	1,143	36.52
Doctors	5	.16
Specialists	12	.38
None	104	3.32
Not Reported		.00
	3,130	

PRACTICAL ARTS INSTRUCTORS

	MALE	FEMALE	TOTAL
NUMBER REPORTING	4,109	2,152	6,261
AVERAGE SALARY	11,052	10,666	10,919
AVERAGE EXPERIENCE--YEARS	9	9	9
AVERAGE AGE	32	35	33

Institution Granting Degree	Number	Percent
Central Michigan University	852	13.61
Eastern Michigan University	606	9.68
Ferris State College	297	4.74
Michigan State University	670	10.70
Northern Michigan University	480	7.67
University of Michigan	131	2.09
Wayne State University	543	8.67
Western Michigan University	1,134	18.11
Adrian College	35	.56
Albion College	9	.14
Alma College	16	.26
Aquinas College	3	.05
Calvin College	3	.05
Andrews University	34	.54
Hillsdale College	16	.26
Hope College	12	.19
Kalamazoo College	1	.02
Madonna College	1	.02
Marygrove College	27	.43
Mercy College	6	.10
Nazareth College	5	.08
Olivet College	1	.02
Siena Heights College	11	.18
University of Detroit	42	.67
Spring Arbor College	3	.05
Grand Valley State College	1	.02
Out-of-State and Foreign	1,319	21.06
	6,261	

Type of Certificate	Number	Percent
Elementary Provisional	25	.40
Elementary Permanent	31	.50
Secondary Provisional	2,291	36.59
Secondary Permanent	3,168	50.60
Life	338	5.40
Full Year Permit	81	1.29
State Limited	1	.02
County Limited		.00
Prov. or Perm. Pending	202	3.23
Not Reported	124	1.98
	6,261	

Highest Degree	Number	Percent
Bachelors	4,183	66.81
Masters	2,012	32.14
Doctors	5	.08
Specialists	12	.19
None	49	.78
Not Reported		.00
	6,261	

TABLE 35.--PROFILE OF VOCATIONAL EDUCATION PERSONNEL HOLDING VOCATIONAL CERTIFICATES IN MICHIGAN PUBLIC SCHOOLS, ACTIVE FALL 1970, BY SUBJECT AREA

AGRICULTURE-VOCATIONAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	191	2	193
AVERAGE SALARY	11,943	8,548	11,908
AVERAGE EXPERIENCE--YEARS	11	1	11
AVERAGE AGE	33	20	33

Institution Granting Degree	Number	Percent
Central Michigan University	4	2.07
Eastern Michigan University		.00
Ferris State College		.00
Michigan State University	175	90.67
Northern Michigan University		.00
University of Michigan		.00
Wayne State University		.00
Western Michigan University	5	2.59
Adrian College		.00
Albion College		.00
Alma College		.00
Aquinas College		.00
Calvin College		.00
Andrews University		.00
Hillsdale College		.00
Hope College		.00
Kalamazoo College		.00
Madonna College		.00
Marygrove College		.00
Mercy College		.00
Nazareth College		.00
Olivet College		.00
Siena Heights College		.00
University of Detroit		.00
Spring Arbor College		.00
Grand Valley State College		.00
Out-of-State and Foreign	9	4.66
	193	

Type of Certificate	Number	Percent
Elementary Provisional		.00
Elementary Permanent		.00
Secondary Provisional	58	30.05
Secondary Permanent	118	61.14
Life	7	3.63
Full Year Permit	3	1.55
State Limited		.00
County Limited		.00
Prov. or Perm. Pending	5	2.59
Not Reported	2	1.04
	193	

Highest Degree	Number	Percent
Bachelors	92	47.67
Masters	97	50.26
Doctors		.00
Specialists	2	1.04
None	2	1.04
Not Reported		.00
	193	

DISTRIBUTIVE EDUCATION-VOCATIONAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	250	54	304
AVERAGE SALARY	11,569	11,407	11,540
AVERAGE EXPERIENCE--YEARS	7	8	7
AVERAGE AGE	31	33	32

Institution Granting Degree	Number	Percent
Central Michigan University	15	4.93
Eastern Michigan University	32	10.53
Ferris State College	41	13.49
Michigan State University	50	16.45
Northern Michigan University	13	4.28
University of Michigan	15	4.93
Wayne State University	41	13.49
Western Michigan University	59	19.41
Adrian College		.00
Albion College	1	.33
Alma College		.00
Aquinas College		.00
Calvin College		.00
Andrews University		.00
Hillsdale College		.00
Hope College	1	.33
Kalamazoo College		.00
Madonna College		.00
Marygrove College		.00
Mercy College		.00
Nazareth College		.00
Olivet College		.00
Siena Heights College		.00
University of Detroit	8	2.63
Spring Arbor College		.00
Grand Valley State College		.00
Out-of-State and Foreign	28	9.21
	304	

Type of Certificate	Number	Percent
Elementary Provisional		.00
Elementary Permanent	1	.33
Secondary Provisional	143	47.04
Secondary Permanent	139	45.72
Life	7	2.30
Full Year Permit		.00
State Limited		.00
County Limited		.00
Prov. or Perm. Pending	10	3.29
Not Reported	4	1.32
	304	

Highest Degree	Number	Percent
Bachelors	149	49.01
Masters	151	49.67
Doctors		.00
Specialists	4	1.32
None		.00
Not Reported		.00
	304	

HEALTH-VOCATIONAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING		8	8
AVERAGE SALARY		12,579	12,579
AVERAGE EXPERIENCE--YEARS		15	15
AVERAGE AGE		45	45

Institution Granting Degree	Number	Percent
Central Michigan University		.00
Eastern Michigan University		.00
Ferris State College		.00
Michigan State University	1	12.50
Northern Michigan University		.00
University of Michigan		.00
Wayne State University	3	37.50
Western Michigan University		.00
Adrian College		.00
Albion College		.00
Alma College		.00
Aquinas College		.00
Calvin College		.00
Andrews University		.00
Hillsdale College		.00
Hope College		.00
Kalamazoo College		.00
Madonna College		.00
Marygrove College		.00
Mercy College	1	12.50
Nazareth College		.00
Olivet College		.00
Siena Heights College		.00
University of Detroit		.00
Spring Arbor College		.00
Grand Valley State College		.00

Type of Certificate	Number	Percent
Elementary Provisional		.00
Elementary Permanent		.00
Secondary Provisional		.00
Secondary Permanent	4	50.00
Life	1	12.50
Full Year Permit		.00
State Limited		.00
County Limited		.00
Prov. or Perm. Pending		.00
Not Reported	3	37.50
	8	

Highest Degree	Number	Percent
Bachelors	3	37.50
Masters	3	37.50
Doctors		.00
Specialists		.00
None	2	25.00
Not Reported		.00
	8	

TABLE 35.--Continued

HOME ECONOMICS-VOCATIONAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	16	1,251	1,267
AVERAGE SALARY	10,175	10,323	10,321
AVERAGE EXPERIENCE--YEARS	5	8	8
AVERAGE AGE	29	33	33

Institution Granting Degree	Number	Percent
Central Michigan University	118	9.31
Eastern Michigan University	110	8.68
Ferris State College	2	.16
Michigan State University	325	25.65
Northern Michigan University	57	4.50
University of Michigan	8	.63
Wayne State University	139	10.97
Western Michigan University	175	13.81
Adrian College	6	.47
Albion College	7	.55
Alma College	2	.16
Aquinas College		.00
Calvin College		.00
Andrews University	1	.08
Hillsdale College	2	.16
Hope College		.00
Kalamazoo College		.00
Madonna College	1	.08
Marygrove College	7	.55
Mercy College	3	.24
Nazareth College		.00
Olivet College		.00
Siena Heights College	1	.08
University of Detroit		.00
Spring Arbor College		.00
Grand Valley State College	1	.08
Out-of-State and Foreign	302	23.83
	1,267	

Type of Certificate	Number	Percent
Elementary Provisional	2	.16
Elementary Permanent	4	.32
Secondary Provisional	595	46.96
Secondary Permanent	514	40.57
Life	76	6.00
Full Year Permit	7	.55
State Limited	2	.16
County Limited		.00
Prov. or Perm. Pending	50	3.95
Not Reported	17	1.34
	1,267	

Highest Degree	Number	Percent
Bachelors	947	74.74
Masters	307	24.23
Doctors	1	.08
Specialists		.00
None	12	.95
Not Reported		.00
	1,267	

OFFICE-VOCATIONAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	249	595	844
AVERAGE SALARY	12,747	11,259	11,698
AVERAGE EXPERIENCE--YEARS	11	9	9
AVERAGE AGE	35	33	34

Institution Granting Degree	Number	Percent
Central Michigan University	61	7.23
Eastern Michigan University	83	9.83
Ferris State College	48	5.96
Michigan State University	81	9.60
Northern Michigan University	44	5.21
University of Michigan	53	6.28
Wayne State University	154	18.25
Western Michigan University	132	15.64
Adrian College	1	.12
Albion College		.00
Alma College	1	.12
Aquinas College		.00
Calvin College		.00
Andrews University		.00
Hillsdale College	2	.24
Hope College	1	.12
Kalamazoo College		.00
Madonna College		.00
Marygrove College	4	.47
Mercy College		.00
Nazareth College		.00
Olivet College		.00
Siena Heights College	4	.47
University of Detroit	20	2.37
Spring Arbor College		.00
Grand Valley State College		.00
Out-of-State and Foreign	155	18.36
	844	

Type of Certificate	Number	Percent
Elementary Provisional		.00
Elementary Permanent	4	.47
Secondary Provisional	291	34.48
Secondary Permanent	488	57.82
Life	37	4.38
Full Year Permit	3	.36
State Limited		.00
County Limited		.00
Prov. or Perm. Pending	15	1.78
Not Reported	6	.71
	844	

Highest Degree	Number	Percent
Bachelors	433	51.30
Masters	404	47.87
Doctors	3	.36
Specialists	4	.47
None		.00
Not Reported		.00
	844	

TRADE AND INDUSTRIAL-VOCATIONAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	736	11	747
AVERAGE SALARY	12,114	12,234	12,11[illegible]
AVERAGE EXPERIENCE--YEARS	9	8	9
AVERAGE AGE	35	39	35

Institution Granting Degree	Number	Percent
Central Michigan University	59	7.90
Eastern Michigan University	58	7.76
Ferris State College	80	10.71
Michigan State University	54	7.23
Northern Michigan University	60	8.03
University of Michigan	45	6.02
Wayne State University	103	13.79
Western Michigan University	131	17.54
Adrian College		.00
Albion College		.00
Alma College	1	.13
Aquinas College		.00
Calvin College		.00
Andrews University	5	.67
Hillsdale College		.00
Hope College		.00
Kalamazoo College		.00
Madonna College		.00
Marygrove College		.00
Mercy College		.00
Nazareth College		.00
Olivet College		.00
Siena Heights College		.00
University of Detroit	2	.27
Spring Arbor College	1	.13
Grand Valley State College		.00
Out-of-State and Foreign	121	16.19
	747	

Type of Certificate	Number	Percent
Elementary Provisional	2	.27
Elementary Permanent		.00
Secondary Provisional	199	26.64
Secondary Permanent	352	47.12
Life	26	3.48
Full Year Permit	39	5.22
State Limited	3	.40
County Limited	1	.13
Prov. or Perm. Pending	27	3.61
Not Reported	98	13.12
	747	

Highest Degree	Number	Percent
Bachelors	332	44.44
Masters	314	42.03
Doctors	2	.27
Specialists	4	.54
None	95	12.72
Not Reported		.00
	747	

TABLE 36.--PROFILE OF PRACTICAL ARTS PERSONNEL HOLDING GENERAL CERTIFICATES IN MICHIGAN PUBLIC SCHOOLS, ACTIVE FALL 1970, BY SUBJECT AREA

AGRICULTURE-GENERAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	32		32
AVERAGE SALARY	11,857		11,857
AVERAGE EXPERIENCE--YEARS	10		10
AVERAGE AGE	34		34

Institution Granting Degree	Number	Percent
Central Michigan University	4	12.50
Eastern Michigan University		.00
Ferris State College		.00
Michigan State University	24	75.00
Northern Michigan University		.00
University of Michigan	1	3.13
Wayne State University	1	3.13
Western Michigan University	1	3.13
Adrian College		.00
Albion College		.00
Alma College		.00
Aquinas College		.00
Calvin College		.00
Andrews University		.00
Hillsdale College		.00
Hope College		.00
Kalamazoo College		.00
Madonna College		.00
Marygrove College		.00
Mercy College		.00
Nazareth College		.00
Olivet College		.00
Siena Heights College		.00
University of Detroit		.00
Spring Arbor College		.00
Grand Valley State College		.00
Out-of-State and Foreign	1	3.12
	32	

Type of Certificate	Number	Percent
Elementary Provisional		.00
Elementary Permanent	1	3.13
Secondary Provisional	4	12.50
Secondary Permanent	21	65.63
Life		.00
Full Year Permit	4	12.50
State Limited		.00
County Limited		.00
Prov. or Perm. Pending	2	6.25
Not Reported		.00
	32	

Highest Degree	Number	Percent
Bachelors	18	56.25
Masters	11	34.33
Doctors		.00
Specialists	1	3.13
None	2	6.25
Not Reported		.00
	32	

BUSINESS EDUCATION-GENERAL

	MALE	FEMALE	TOTAL
NUMBER REPORTING	1,328	1,312	2,640
AVERAGE SALARY	10,804	10,494	10,650
AVERAGE EXPERIENCE--YEARS	8	9	9
AVERAGE AGE	31	34	32

Institution	Number	Percent
Central Michigan University	345	13.07
Eastern Michigan University	264	10.00
Ferris State College	270	10.23
Michigan State University	226	8.56
Northern Michigan University	184	6.97
University of Michigan	72	2.73
Wayne State University	164	6.21
Western Michigan University	495	18.75
Adrian College	12	.45
Albion College	1	.04
Alma College	10	.38
Aquinas College	3	.11
Calvin College	3	.11
Andrews University	11	.42
Hillsdale College	7	.27
Hope College	12	.45
Kalamazoo College	1	.04
Madonna College	1	.04
Marygrove College	9	.34
Mercy College		.00
Nazareth College	1	.04
Olivet College		.00
Siena Heights College	5	.19
University of Detroit	35	1.33
Spring Arbor College	3	.11
Grand Valley State College		.00
Out-of-State and Foreign	506	19.12
	2,640	

Type of Certificate	Number	Percent
Elementary Provisional	7	.27
Elementary Permanent	4	.15
Secondary Provisional	1,069	40.49
Secondary Permanent	1,265	47.92
Life	175	6.63
Full Year Permit	23	.87
State Limited		.00
County Limited		.00
Prov. or Perm. Pending	67	2.54
Not Reported	30	1.14
	2,640	

Highest Degree	Number	Percent
Bachelors	1,807	68.45
Masters	826	31.29
Doctors		.00
Specialists	2	.08
None	5	.19
Not Reported		.00
	2,640	

TABLE 36.--Continued

HOME ECONOMICS-GENERAL	MALE	FEMALE	TOTAL
NUMBER REPORTING	20	819	839
AVERAGE SALARY	10,266	10,939	10,923
AVERAGE EXPERIENCE--YEARS	8	10	9
AVERAGE AGE	32	36	36

Institution Granting Degree	Number	Percent
Central Michigan University	84	10.01
Eastern Michigan University	46	5.48
Ferris State College		.00
Michigan State University	151	18.00
Northern Michigan University	26	3.10
University of Michigan	7	.83
Wayne State University	116	13.83
Western Michigan University	76	9.06
Adrian College	19	2.26
Albion College	6	.72
Alma College	5	.60
Aquinas College		.00
Calvin College		.00
Andrews University	10	1.19
Hillsdale College	6	.72
Hope College		.00
Kalamazoo College		.00
Madonna College		.00
Marygrove College	17	2.03
Mercy College	6	.72
Nazareth College	4	.48
Olivet College	1	.12
Siena Heights College	6	.72
University of Detroit	1	.12
Spring Arbor College		.00
Grand Valley State College		.00
Out-of-State and Foreign	252	30.03
	839	

Type of Certificate	Number	Percent
Elementary Provisional	5	.60
Elementary Permanent	12	1.43
Secondary Provisional	260	30.99
Secondary Permanent	424	50.54
Life	59	7.03
Full Year Permit	7	.83
State Limited		.00
County Limited		.00
Prov. or Perm. Pending	42	5.01
Not Reported	30	3.58
	839	

Highest Degree	Number	Percent
Bachelors	646	77.00
Masters	183	21.81
Doctors	3	.36
Specialists	1	.12
None	6	.72
Not Reported		.00
	839	

INDUSTRIAL ARTS-GENERAL	MALE	FEMALE	TOTAL
NUMBER REPORTING	2,729	21	2,750
AVERAGE SALARY	11,169	10,747	11,165
AVERAGE EXPERIENCE--YEARS	9	12	9
AVERAGE AGE	32	38	32

Institution Granting Degree	Number	Percent
Central Michigan University	419	15.24
Eastern Michigan University	296	10.76
Ferris State College	27	.98
Michigan State University	269	9.78
Northern Michigan University	270	9.82
University of Michigan	51	1.85
Wayne State University	262	9.53
Western Michigan University	562	20.44
Adrian College	4	.15
Albion College	2	.07
Alma College	1	.04
Aquinas College		.00
Calvin College		.00
Andrews University	13	.47
Hillsdale College	3	.11
Hope College		.00
Kalamazoo College		.00
Madonna College		.00
Marygrove College	1	.04
Mercy College		.00
Nazareth College		.00
Olivet College		.00
Siena Heights College		.00
University of Detroit	6	.22
Spring Arbor College		.00
Grand Valley State College	1	.04
Out-of-State and Foreign	560	20.36
	2,750	

Type of Certificate	Number	Percent
Elementary Provisional	13	.47
Elementary Permanent	14	.51
Secondary Provisional	958	34.84
Secondary Permanent	1,458	53.02
Life	104	3.78
Full Year Permit	47	1.71
State Limited	1	.04
County Limited		.00
Prov. or Perm. Pending	91	3.31
Not Reported	64	2.33
	2,750	

Highest Degree	Number	Percent
Bachelors	1,712	62.25
Masters	992	36.07
Doctors	2	.07
Specialists	8	.29
None	36	1.31
Not Reported		.00
	2,750	

Consultants/Specialists

Full-time reimbursed consultants/specialists in fifty-four K-12 districts surveyed by telephone totaled nine full-time and four part-time. Intermediate school districts engaged eight consultants and eleven implementors, bringing the total of full-time reimbursed consultants/specialists at the secondary level to twenty-eight.

Guidance and Placement Personnel

Identification of numbers of vocational guidance and placement personnel proved very difficult. Responses from 350 secondary districts with reimbursed vocational education programs, which answered the 1970/71 Annual and Long Range Vocational-Technical Education Plan survey of the State Vocational Education Services office indicated that they employed 1258.5 full-time equated guidance personnel and that 528 of them had "specific vocational guidance preparation." This is supplemented with information furnished by fifty-four secondary vocational directors that they had seventeen full-time and four part-time vocational guidance and placement personnel. The upshot of this is the probability that most guidance and placement personnel are not assigned exclusively to vocational programs, but function with total school programs.

Paraprofessionals

The same fifty-four secondary vocational directors and twelve secondary area vocational center directors reported a total of nineteen full-time and four part-time paraprofessionals in their organizations.

Secondary Area Vocational Center Personnel

Analysis of the 298 full-time personnel at fully operative area vocational centers (twelve excluding Detroit) reveals the following personnel: 234 teachers, 22 coordinators, 19 administrators/supervisors, 1 consultant, 12 guidance and placement, and 10 paraprofessionals. Quantities of part-time personnel are unclear, but seem much smaller than in community colleges. This information

was gathered by personal interviews with school principals during March, 1971. Additional personnel engaged at area vocational centers which are at earlier points in their development are not included in the above figures. A staffing pattern for centers has taken form: an average of twenty-five full-time personnel per center, consisting of 79% teachers, 8% administrators/supervisors, and 13% ancillary personnel. This pattern is based on fully operative centers plus a few others whose staffing plans were firm.

Of special interest is the differentiated staffing pattern being installed at the Capitol Career Center, Ingham Intermediate School District. Five staffing classifications labeled director, assistant director, learning systems coordinator, instructional manager, and aide will be present when the school is fully operative.

Community College Personnel

Teachers

The record of quantities of reimbursed post-secondary vocational teachers over the past five years is contained in Table 37. In 1969/70 the record shows 847 full-time and 754 part-time for a total count of 1601. This number may have increased considerably for 1970/71, with totals of 991 full-time and 926 part-time for a total of 1917. It should be added, however, that this apparent increase may not be true in fact, since these data were collected in two different manners: 1969/70 coming from reimbursement contract totals and the 1970/71 acquired through personal interviews with community college deans. The latter report would likely be higher, since some nonreimbursed faculty are probably included. The part-time teacher count for 1970/71 is based upon numbers of individuals employed during the spring term or semester only. This does not indicate the rather larger stocks of part-timers who were not engaged during that spring term, but who might have been engaged at other times.

An additional enumeration of community college personnel by three divisions, business, health sciences, and vocational-technical, was obtained from Bureau of the Budget data (Table 38) indicating a full-time equivalent total of 1,275 faculty for the 1970/71 school year, broken down into 399 in business commerce, 246 in health sciences, and 628 in vocational-technical.

TABLE 37.--NUMBER OF TEACHERS IN REIMBURSED POST SECONDARY VOCATIONAL EDUCATION PROGRAMS BY OCCUPATIONAL CODE: STATE OF MICHIGAN, FISCAL YEARS 1966 to 1970

Type of Program	1966			1967			1968			1969			1970		
	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time	TOTAL	Full-Time	Part-Time
01 Agric.	12	6	6	16	5	11	22	9	13	24	11	13	35	21	14
04 D.E.	46	2	44	49	3	46	58	3	55	79	7	72	76	42	34
07 Health	124	97	27	145	134	11	211	161	50	313	235	78	336	228	108
09 Home Ec	4	0	4	3	0	3	1	NA*	1	15	0	15	32	7	25
14 Office	111	1	110	213	36	177	235	68	167	311	141	170	292	118	174
16 Tech	201	113	88	320	98	222	290	167	123	341	205	136	384	177	207
17 T&I	940	92	848	344	108	236	285	194	91	727	334	393	446	254	192
TOTAL	1,438	311	1,127	1,090	384	706	1,102	602	500	1,810	933	877	1,601	847	754

*NA - No information available

Source: Michigan Department of Education, Vocational Education Service Files, OE Form 3136

TABLE 38.--NUMBER OF FTE COMMUNITY COLLEGE ADMINISTRATORS AND TEACHERS BY COLLEGE DIVISION, 1970/71

Personnel (FTE)	Business Commerce	Health Sciences	Vocational Technical	Total
Administration	13.6	18.8	49.7	82.1
Faculty	399.4	246.4	628.4	1,275.2
TOTAL[a]	413.0	265.2	678.2	1,356.4

[a]Total does not include Lansing Community College or Highland Park Community College.

Source: Bureau of Budget, Executive Office, State of Michigan.

Administrators

State Vocational Education Service data indicate a total count of eighty persons who had supervisory responsibilities in community college occupational education. These positions include deans, assistant deans, directors, assistant directors, chairmen, coordinators, heads, and supervisors. Bureau of Budget data are approximately the same, showing eighty-two FTE administrative personnel.

Consultants

Very few full-time consultants or specialists are employed by occupational education divisions in community colleges. Only three were discovered by interviewing occupational deans. Apparently services of such individuals are available at most community colleges, but on a total college basis.

Guidance and Placement Personnel

Student personnel services in guidance, counseling, and placement are available, but usually on a full college basis. Very few community colleges have these ancillary personnel attached full-time to occupational divisions.

Paraprofessionals

Approximately ten paraprofessionals were employed during 1970/71, although it is probable that considerably more individuals serve in this type of capacity. Moreover, many institutions plan to make more use of paraprofessionals next year.

Adult Education Personnel

Although adult education is to become more fully a post-secondary administrative function, sizeable programs are still administered by secondary units. Adult education teachers are not classified in either of the preceding sections. A count of adult education teachers over the past five years (Table 39) shows that the preponderance of adult education teachers are part-timers and that a heavy majority of these are from business and industry. Some part-time adult teachers may be duplicated in the secondary and post-secondary counts, since some of these people serve in both programs. It is not feasible to attempt an inventory of the other types of vocational-technical personnel associated with adult education, since frequently the same secondary and post-secondary personnel service more than one program.

State Office Personnel

Of the forty-five professionals employed in the State Office of Vocational Education and Career Development, twelve are classified as administrators, thirty as consultants, and three as researchers. The latter individuals are members of the Research Coordinating Unit, which is attached to the Research, Assessment, and Evaluation Services, not directly to the Vocational Education and Career Development Services.

University and Four-Year College Personnel

Stocks of university personnel are included in this report, since the professional preparation of university personnel is a direct responsibility of certain universities by reason of their advanced degree programs, and all eight universities need professional staff for their operations. Attempts to make an accurate, consistent count of full-time university personnel in teacher

TABLE 39.--NUMBER OF TEACHERS IN REIMBURSED ADULT VOCATIONAL EDUCATION PROGRAMS BY OCCUPATIONAL CODE, STATE OF MICHIGAN, FISCAL YEARS 1966-1970

Type of Program	1966				1967				1968				1969				1970			
		Part-time				Part-time				Part-time				Part-time				Part-time		
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
01 Agriculture	--	1	--	13	--	82	12	3	--	60	10	4	--	43	1	--	0	(----45---)		
04 Distributive	4	6	131	204	4	4	6	475	3	8	175	232	3	5	47	284	22	(---324---)		
07 Health	--	--	--	--	--	--	--	22	--	--	--	23	1	--	8	11	3	(----43---)		
09 Home Ec	--	361	10	351	358	--	--	--	294	11	15	--	251	10	11	--	--	(---299---)		
14 Office	--	46	19	15	--	26	7	186	--	119	37	57	--	42	45	123	23	(---361---)		
16 Technical	--	--	25	15	9	--	58	51	32	--	--	42	19	9	3	38	6	(---153---)		
17 T&I	--	--	--	191	27	17	137	793	105	34	18	1214	48	151	123	653	172	(--1373---)		
SUB TOTAL	4	414	185	974	398	129	220	1530	434	232	255	1572	322	260	238	1109	226	(--2598---)		
SUB TOTAL	4	(---1573----)			398	(---1879----)			434	(---2059----)			322	(---1607----)			226	(--2598---)		
GRAND TOTAL	(------1577----)				(--------2277----)				(--------2493----)				(--------1929----)				(--------2824---)			

A = Full-time; B = Secondary, C = Post-Secondary, D = Business and Industry.

Source: Department of Education, Vocational Education Services Files, OE Form 3136.

education encountered difficulty because of variations in organizational structure and duty assignments. For example, professional teacher education is separated from subject matter departments in some institutions, while in others there is no such separation. Further, some faculty are assigned to professional teacher education courses full-time, while others cover both professional education and subject matter content courses. It is simply very difficult to separate those directly involved in vocational-technical education personnel development from those involved with various other kinds of curricula at the universities. Persons involved in teaching professional education courses were subjects in this count. Individuals who taught only subject matter technical content were not knowingly included. With these qualifications in mind, and with a measure of hesitancy, the following counts are presented as Table 40.

TABLE 40.--UNIVERSITY OCCUPATIONAL TEACHER EDUCATION PERSONNEL

Agriculture	Business	Health	Home Economics	Industrial	Common
5	44	0	22	70	3

It is interesting to note that there were no personnel in health, and that three persons were designated as common or across-the-board vocational educators, since they considered their primary responsibility to be that of developing and operating such programs.

No attempt was made to inventory administrators, since most persons with such responsibilities are not full-time at the task. They, like most vocational teacher educators, are spread in varying proportions between teaching, research, consultation, and administration. For the same reason consultants/specialists could not be inventoried.

It is impossible to identify full-time vocational-technical researchers at the Michigan universities, since such are basically nonexistent. Many faculty carry on research, and a few individuals are occasionally so engaged for the majority of their loads for a limited period. Guidance and placement personnel are attached to other university departments, but very few specialize in

vocational guidance. About three or four paraprofessionals are employed by universities primarily as individuals responsible for maintaining equipment and for the procurement of supplies and materials.

Incomplete data on the academic qualifications of teacher educators were heavily weighted in favor of the doctorate degree, a 2:1 ratio of doctorates over other qualifications existed.

A summary of current personnel stocks as contained in the previous pages is presented as Table 41. No entry is made for guidance and placement personnel, and university personnel are not classified as to personnel type.

Sources of Personnel

There is a variety of ways to look at personnel sources for vocational-technical education. Some of these are new teachers or returning former teachers, degree or nondegree teachers, personnel with teacher education or without teacher education, preservice or inservice, and instate or outstate. Evans furnished a valuable analysis for preservice preparation routes in his new book, Foundation of Vocational Education (10). A study by Gibbs identified the sources of Wisconsin vocational-technical teachers (Table 42). The largest single category was business and industry, amounting to nearly 33%, with teacher education the second largest source at nearly 16%. Since it would be dangerous to generalize and assume that Gibbs' findings would apply to the situation in neighboring Michigan, an independent survey of Michigan personnel was conducted using the following source categories:

Employment in Education
- Nonteaching--(Administrator, Consultant, etc.)
- Teacher, Private School
- Teacher, Secondary Nonvocational
- Teacher, Secondary Vocational
- Teacher, Post-Secondary Nonoccupational
- Teacher, Post-Secondary Vocational Occupational

Noneducation Employment
- Business, Industry, Agriculture
- Social and Personal Services
- Military Service
- Homemaking and Nonwage Earning

TABLE 41.--CURRENT STOCKS OF VOCATIONAL-TECHNICAL PERSONNEL, BY TYPE AND EMPLOYER, INCLUSIVE OF FULL AND PART-TIME

Personnel	Employer				
	Local K-12 District	Intermediate District	Community College	University and 4-year College[a]	State Office
Teacher/Teacher Coordinator	2823	--	1601		--
Administrator/Supervisor	74	--	80		12
Consultant/Specialist -Curriculum -Instructional -Materials Development	13	19	3	144	30
Guidance and Placement Personnel	?	?	?		--
Researcher	--	--	--		3
Paraprofessional -Instructional -Service	23	--	10	4	--

[a]Teacher education personnel

TABLE 42.--VOCATIONAL-TECHNICAL TEACHER SOURCES BY CURRICULUM AREA IN WISCONSIN (BY PERCENT)

Curriculum	Business and Industry	Teacher Education	General Education	High School Vocational	High School Academic	Vocational System	Military	College Teacher	Nursing	Non Labor Force	Total
Trade & Industry	55.36	18.88	1.72	12.45	3.00	3.00	4.72	0.86	0.00	0.00	100.00
Business & Office	34.62	13.46	1.92	30.13	8.33	1.28	0.64	3.21	0.64	5.77	100.00
Home Economics	21.74	13.04	4.35	21.74	17.39	4.35	0.00	0.00	0.00	17.39	100.00
Agriculture	13.64	13.64	0.00	54.55	9.09	0.00	4.55	4.55	0.00	0.00	100.00
Distributive	43.75	25.00	12.50	9.38	3.13	0.00	3.13	3.13	0.00	0.00	100.00
Health	15.19	7.59	1.27	0.00	1.27	1.27	1.27	7.59	59.49	5.06	100.00
Technical	48.51	22.77	1.98	4.95	6.93	5.94	4.95	3.96	0.00	0.00	100.00
General Academic	18.50	13.00	6.50	2.50	45.50	0.00	1.00	10.00	0.00	3.00	100.00
Coord-Supervisor	20.20	15.15	3.03	18.18	20.20	3.54	6.57	5.56	4.55	3.03	100.00
Totals	32.85	15.71	3.26	13.60	15.90	2.30	3.35	4.79	5.46	2.78	100.00

Source: (15)

Student Formal Education Studies
Student, Degree with Teacher Education
Student, Degree without Teacher Education
Student, Community College Occupational Training
Student, Private Occupational School

The results of this survey, which did not include K-12 district personnel or teacher educators, appears as Appendix 5. Nearly 40% of the full-time teachers came from employment in education, about 36% from noneducation, and 21% from formal studies.

Other personnel source categories included in this survey were (1) out-of-state residents (Appendix 6) and (2) former teachers returning to the classroom (Appendix 7). Fourteen percent of all full-time personnel were recruited from outstate, and 14.1% had returned to employment in education after an absence of a year or more. Personnel in community colleges, intermediate school districts, area vocational centers, and the State Office were included, as were secondary vocational directors, but not K-12 district teachers and teacher educators.

The following seven personnel sources were determined to be an appropriate frame of reference for examining sources of vocational-technical education personnel. They are a modification and expansion of the categories used by the NEA in its annual report, Teacher Supply and Demand in Public Schools (43).

1. Graduates currently completing teacher education programs
2. Teacher education graduates who postponed entry
3. Qualified former teachers interested in re-entering
4. Qualified teachers who have been assigned nonteaching positions in education
5. Teachers who are in higher education, private schools, or overseas schools
6. Individuals with degrees but without teacher certification requirements completed
7. Persons without degrees or teacher certification from business, industry, military, etc.

These categories should not be regarded as being mutually exclusive. The nature of these sources as possibilities for vocational education will be discussed in the next paragraphs. Although the magnitude of some of these sources has been very difficult to determine, the best estimates available are included.

Teacher Education Graduates Who Postpone Entry

Based on the most recent (1969/70) NEA information on Michigan vocational-technical and practical arts graduates, 58% went into teaching immediately, 25% went into nonteaching engagements, and for 17% there was no information (43). It is possible that a large portion of the individuals in the latter two groups, perhaps as many as one-third, may eventually enter teaching, particularly the 5.5% who continued their formal studies.

Former Teachers

It is interesting to speculate as to the supply and demand situation if all living able-bodied former teachers were to become available tomorrow for teaching. It has been said that there would be no shortage. Former teachers do constitute a pool of personnel which cannot be overlooked. It includes, among others, married women who would return to the classroom and retirees who could be available, particularly for part-time teaching responsibilities. Personnel can be tapped from this source more easily as the conditions of service in education are improved and as economic conditions on the "outside" become more stringent.

Survey data indicates that 15.6% of all full-time occupational teachers contacted were individuals who did return to teaching after absence from the classroom of a year or more sometime in their careers (Appendix 7). The percentage varies with categories of employers and with types of personnel. Unfortunately, the survey questionnaire was not designed to establish an annual re-entry factor for purposes of projecting quantities of former teachers as a source of supply in the future. The annual NEA report indicates returnees approximate 3% of the new teacher supply for all secondary-level subjects (43).

Qualified Teachers from Nonteaching Positions in Education

This is not one of the largest sources of personnel, since most qualified teachers in nonteaching positions are likely to be administrators/supervisors and they are not inclined to return to positions of lower pay and status. Our survey data indicated that 8.9% of the full-time teachers surveyed came from nonteaching positions or responsibilities in education.

Qualified Teachers Who Have Been in Higher Education, Overseas, and Private Schools

No information is available as to the quantities of these individuals making themselves available in Michigan each year, but the number is believed to be quite small. Our data indicated that 2.3% of the full-time teachers surveyed were recruited from teaching positions in private schools, and that 2.0% of all full-time vocational personnel came from the same source.

Individuals with Degrees but without Complete Teacher Education Qualifications

This supply is utilized primarily in post-secondary and adult occupational programs. Very few are employed in regular secondary positions. The annual supply from this source is impossible to determine accurately. In the past these individuals have been issued "Special" vocational teaching certificates upon recommendation of the employing school administrator. However, existing records of "Specials" issued are difficult to separate into those with degrees and those with less than degree qualifications. In the newly adopted vocational teacher certification rules it will be possible to identify these persons, since their vocational teaching certificates will be titled "Vocational Authorization." Our survey indicated that 4.9% of the full-time teachers and 4.0% of all vocational-technical personnel contacted had been recruited directly after college, and had a degree but no teacher education. No doubt many of the personnel recruited from noneducation sources (business, industry, military, homemaking, etc.), which amounted to 35%, also fit this category.

A significant number of these individuals with degrees but without teacher eudcation credentials decide to acquire regular vocational certification via post-Bachelor's degree programs, either on an inservice or preservice basis (Table 43). The 1969/70 figures were a matter of record, while those for 1970/71 were anticipated completions. It is significant that the vast majority of these are in business education. A few institutions, such as Wayne State University, have special programs specifically designed for these people, in which they can acquire both teacher certification and a Master of Arts in Teaching. This source, coupled with preservice and inservice post-degree teacher education programs, constitutes one of the better quality sources of personnel,

TABLE 43.--NUMBER OF INITIAL VOCATIONAL TEACHING CERTIFICATES EARNED VIA THE POST-BACHELOR'S DEGREE ROUTE 1969/70 AND 1970/71

Occupation	1969/70	1970/71[a]
Agriculture	0	2
Business	184	262
Home Ec	28	26
Industrial	13	37
TOTAL	225	327

[a]Anticipated Output.

particularly those who have acquired a number of years of relevant work experience before deciding to enter teaching.

Persons without Degrees or Teacher Education from Business, Industry, Military, etc.

This and the previously cited source constitute a padding or cushion when regularly qualified personnel are in short supply or are completely unavailable. Vocational teacher education codes are usually written so that in times of teacher shortages there will be enough flexibility to allow utilization of other sources, particularly non-degree and nonteacher education candidates. In 1969/70, 1013 "Specials" were issued. This is almost cne-third of the 3234 total (Table 44). Many of the "Specials" are probably persons without degrees or teacher education training, but the exact number is not available. They are persons with relevant work experience and specialized types of training. Many more of these types are included in the "MDTA" and "Community College Approvals" (Table 44). It is of interest that approximately 7% of the full-time personnel and 21% of the part-time personnel contacted in our survey did not have a college degree.

TABLE 44.--SUMMARY OF VOCATIONAL CERTIFICATES ISSUED, 1969-70

Occupational Field	Sec. Perm.	Sec. Prov.	1 Yr. Spec.	3 Yr. Spec.	5 Yr. Spec.	MDTA	Com. Coll. Approvals	Total
Agriculture	13	54	14	2	0	0	14	97
Business Education	58	140	84	42	0	0	203	527
Cooperative Education	112	156	69	11	0	0	14	362
Home Economics	105	546	138	119	0	0	21	929
Trade and Industry	64	88	292	240	2	30	612	1328
TOTAL	352	984	597	414	2	30	864	3243

Source: Michigan Vocational Education Services Certification Files

Graduates Currently Completing Teacher Education Programs

This source of personnel normally attracts most attention because under normal circumstances it, along with business and industry, represent the largest annual sources. (The community college transfer to baccalaureate degree teacher education programs can be included in this category, as can the practical or applied arts graduates, who with additional work experience and/or course work could meet vocational teacher certification code requirements.) Three existing data sources of the quantities of new teacher education graduates were located. They are State Vocational Education Services reports to the U.S. Office of Education, the Higher Education General Information Survey, and the NEA survey of supply and demand (43).

State Vocational Service reports to the United States Office of Education include the numbers completing State Plan requirements for teacher certification by occupational field (Table 45). An additional table containing output information along occupational lines by universities for 1970 is included as Appendix 8. These data are annually supplied to the State Vocational Service by the Michigan teacher education institutions.

TABLE 45.--NUMBER COMPLETING STATE PLAN REQUIREMENTS FOR VOCATIONAL TEACHER CERTIFICATION THROUGH UNIVERSITY ROUTE 1969/70

Occupational Area		Preservice	Inservice	Total
01	Agriculture	34	13	47
04	D.E.	111	18	129
09	Home Ec	316	75	391
14	Office	365	55	420
17	T&I	116	110	226
	TOTAL	942	271	1,213

Source: State Vocational Service Annual 1970 Report to U.S.O.E.

The Higher Education General Information Survey data furnish information as to Bachelor's, Master's, and Doctor's degrees granted by major fields over the past three years (Appendix 9). Although not all of these individuals can be assumed to have earned teaching certificates, it is probable that all but a few did so. It is not possible to disaggregate those completing vocational certificates from the HEGIS information. Most of those earning Master's and Doctor's degrees probably had initial teacher certification qualifications prior to commencing graduate degree programs. The HEGIS also contains information on output from nonpublic colleges and universities.

NEA Survey of New Supply

For many years the National Education Association has annually researched the supply and demand situation across the nation, asking each State Department of Education to supply data. Included in their survey is output of graduates currently completing teacher education programs which covers a span of six years, with the latter year being an estimate of anticipated outputs (Table 46). The NEA research concentrates on inventorying the number completing standard teaching certificates for the first time, but does not differentiate between vocational and general certification. These data include the output from nonpublic colleges and universities (43).

University Outputs of Initial Certificates

Up to this point, three sources of data on annual outputs of new personnel have been presented. Close examination of these data, however, reveals variations of considerable magnitude which are due to a number of factors, including variations in sources, timing, requests, definitions, etc. For the purposes of this study the data presented next are regarded as being most appropriate, since they were gathered by direct contact with department chairmen in the eight approved public vocational teacher education colleges through their official institutional vocational teacher education contact persons. Most of the data was collected between February 15th and April 15th, 1971, and therefore includes fairly accurate estimates of 1970/71 outputs.

TABLE 46.--SUMMARY OF THE NEW SUPPLY OF INSTRUCTIONAL PERSONNEL BY SUBJECT AREA AND BY DEGREE GRANTED FOR ACADEMIC YEARS 1965/66-1970/71

Year & Subject Area	Number of students completing preparation for standard teaching certificates for the first time					
	Bachelor's			Master's		
	Men	Women	TOTAL	Men	Women	TOTAL
1965/66						
Agriculture	36	---	36	1	--	1
Business Education	107	171	278	17	16	33
Distributive Education	7	5	12	3	--	3
Home Economics	5	184	189	--	15	15
Industrial Arts	115	27	164	26	14	40
Trade & Industrial	30	---	30	1	--	1
1966/67						
Agriculture	32	---	32	--	--	--
Business Education	191	193	384	20	13	33
Distributive Education	10	6	16	5	1	6
Home Economics	1	239	240	--	11	11
Industrial Arts	155	--	155	22	--	22
Trade & Industrial	48	1	49	--	--	--
1967/68						
Agriculture	38	--	38	--	--	--
Business Education	206	232	438	22	22	44
Distributive Education	33	4	37	9	2	11
Home Economics	1	250	251	--	10	10
Industrial Arts	154	1	155	27	--	27
Trade & Industrial	102	2	104	7	--	7
1968/69						
Agriculture	30	---	30	--	--	--
Business Education	219	249	468	13	12	25
Distributive Education	32	4	36	6	1	7
Home Economics	---	228	228	--	7	7
Industrial Arts	211	---	211	6	--	6
Trade & Industrial	85	---	85	2	--	2
1969/70						
Agriculture	31	4	35	--	--	--
Business Education	344	308	652	11	10	21
Distributive Education	45	11	56	9	3	12
Home Economics	---	381	381	--	8	8
Industrial Arts	241	---	241	1	--	1
Trade & Industrial	142	---	142	--	--	--
1970/71 (Estimated)						
Agriculture	36	3	39	--	--	--
Business Education	340	350	690	9	9	18
Distributive Education	41	8	49	9	5	14
Home Economics	--	413	413	--	7	7
Industrial Arts	269	1	270	2	--	2
Trade & Industrial	147	--	147	--	--	--

Source: Michigan Data for NEA Teacher Supply & Demand in Public Schools Study, Michigan Department of Education

The following tables present past and anticipated outputs, plus current enrollments, of those gaining initial certification via the Bachelor's degree route and post-Bachelor's degree route. In each case universities were asked to categorize their outputs according to three forms of certification as follows:

1. Number qualifying for general (only) secondary provisional certificates (includes practical or applied arts majors).

2. Number qualifying for vocational (only) secondary provisional certificates.

3. Number qualifying for both vocational and general provisional secondary certificates.

These categories were determined to be compatible with current certification code regulations and with the anticipated revised certification code due to be established in the near future.

Table 47 presents composite output of all public institutions via Bachelor's degree and post-Bachelor's degree routes by occupational area, arranged by vocational, general, and combined certification groupings. The figures on practical or applied arts outputs are included because they constitute one of the more sizeable potential sources of vocational teachers. A large proportion of these people was indicated to be lacking only additional work experience before being able to qualify as vocational teachers, although some would need to acquire additional course work too.

Past and anticipated outputs, plus current enrollments, of those gaining initial certification via the Bachelor's and post-Bachelor's degree routes are presented next, according to occupational area groupings (Table 48). This table furnishes information as to types of certificates and outputs by specific institutions. A third table (Appendix 10) furnishes past and anticipated outputs, plus current enrollments of those gaining initial certification, arranged according to composite output of each institution. Detailed outputs are furnished as to types of certification and occupational areas.

Respondents were asked to indicate the number of inservice teachers currently enrolled in their programs working toward initial certification. Although there is reason to question the validity of some of the data or lack of data submitted, indications are that approximately one-sixth of all active majors on the Bachelor's and post-Bachelor's degree routes to initial certification were

TABLE 47.--VOCATIONAL-TECHNICAL & PRACTICAL ARTS INITIAL CERTIFICATION OUTPUTS BY CERTIFICATE TYPE, 1966/67-1974/75

Initial Certification via BA/BS Degree Route & Post BA/BS Route	Past Outputs - Completions				Current Enrollments	Anticipated Outputs				
	66/67	67/68	68/69	69/70	Total Active Majors	70/71	71/72	72/73	73/74	74/75
Vocational Certification[a]										
Agriculture	30	31	25	34	44	24	17	12	17	22
Business[b]	186	384	811	718	1350	894	1006	1027	1098	1141
Home Ec	236	234	301	358	959	399	441	455	473	491
Industrial	94	116	149	166	524	227	257	305	365	404
TOTAL	546	765	1286	1276	2877	1544	1721	1799	1953	2058
General (Only) Certification										
Agriculture	1	2	2	2	18	3	3	4	4	4
Business	243	259	273	276	672	237	144	144	139	152
Home Ec	2	8	5	7	29	12	15	20	25	30
Industrial	177	209	267	353	505	409	410	432	465	539
TOTAL	423	478	547	638	1124	661	572	600	633	725

[a] Includes those gaining Vocational Certification and those qualifying for both Vocational and General Provisional Certification.

[b] These future outputs include distributive teachers as follows: 1970/71, 91; 1971/72, 93; 1972/73, 107; 1973/74, 114; 1974/75, 120.

TABLE 48.--VOCATIONAL-TECHNICAL & PRACTICAL ARTS INITIAL CERTIFICATION OUTPUTS BY OCCUPATIONAL AREA, 1966/67-1974/75

Initial Certification via BA/BS Degree Route & Post BA/BS Route	Past Outputs - Completions				Current Enrollments	Anticipated Outputs				
	66/67	67/68	68/69	69/70	Total Active Majors	70/71	71/72	72/73	73/74	74/75
Agriculture										
Vocational Certification[a]										
Michigan State University	30	31	25	34	44	24	17	12	17	22
General (Only) Certification										
Western Michigan University	1	2	2	2	18	3	3	4	4	4
Business										
Vocational Certification[a]										
Central Michigan University	20	30	44	75	320	112	126	136	162	180
Eastern Michigan University	26	33	45	64	--[b]	76	79	66	64	64
Ferris State College	20	30	25	35	155	40	45	45	50	50
Michigan State University	40	39	42	68	132	108	109	103	133	133
Northern Michigan University	--	--	--	1	64	15	74	79	86	92
University of Michigan	9[c]	22[c]	16[c]	12[c]	--[b]	5[c]	--[b]	8	16	16
Wayne State University	NA[d]	135[e]	496	257	679	257	280	295	300	315
Western Michigan University	71	95	143	206	--[b]	263	293	295	287	291
TOTAL	186[f]	384[f]	811	718	1350[f]	894	1006[f]	1027	1098	1141
Business										
General (Only) Certification										
Central Michigan University	20	15	40	25	80	22	23	33	35	46
Eastern Michigan University	23	31	38	61	--[b]	56	44	41	39	36
Ferris State College	23	33	25	35	155	45	45	50	50	55
Michigan State University	98	81	59	59	44	34	17	20	15	15
Northern Michigan University	42	57	64	64	56	53	--[g]	--[g]	--[g]	--[g]
Western Michigan University	37	42	47	32	--[b]	27	15	0	0	0
TOTAL	243	259	273	276	672[f]	237	144	144	139	152

TABLE 48.--Continued.

Initial Certification via BA/BS Degree Route & Post BA/BS Route	Past Outputs - Completions				Current Enrollments	Anticipated Outputs				
	66/67	67/68	68/69	69/70	Total Active Majors	70/71	71/72	72/73	73/74	74/75
Home Economics										
Vocational Certification[a]										
Central Michigan University	25	20	32	40	62	42	50	55	60	60
Eastern	38	37	49	46	288	59	75	88	97	110
Michigan State University	88	89	80	110	91	110	100	95	90	90
Northern Michigan University	17	7	17	28	215	25	31	35	40	45
Wayne State University	15	22	33	40	204	43	64	55	58	57
Western	53	59	90	94	314	120	121	127	128	129
TOTAL	236	234	301	358	1174	399	441	455	473	491
Home Economics										
General (Only) Certification										
Central Michigan University	--[b]	--[b]	--[b]	1	--[b]	0	0	0	0	0
Eastern Michigan University	2	4	2	6	29	12	15	20	25	30
Northern Michigan University	0	0	1	0	0	0	0	0	0	0
Wayne State University	0	4	2	0	0	0	0	0	0	0
TOTAL	2[f]	8[f]	5[f]	7	29[f]	12	15	20	25	30
Industrial										
Vocational Certification[a]										
Central Michigan University	0	0	0	8	40	21	26	32	38	42
Eastern Michigan University	11	10	18	18	--[b]	22	23	23	23	23
Ferris State College	27	40	61	64	200	70	76	83	91	100
Michigan State University	4	5	4	3	4	9	9	9	9	9
Northern Michigan University	12	9	8	13	--[j]	17	19	20	29	34
University of Michigan	3[c]	4[c]	--[b]	--[b]	--[b]	--[b]	--[b]	17[h]	34[i]	34[i]
Wayne State University	16	22	26	33	280	55	64	75	88	102
Western Michigan University	21	26	32	27	--[b]	33	40	46	53	60
TOTAL	94	116	149[f]	166[f]	524[f]	227[f]	257[f]	305[h]	365[i]	404[i]

TABLE 48.--Continued.

Initial Certification via BA/BS Degree Route & Post BA/BS Route	Past Outputs - Completions				Current Enrollments	Anticipated Outputs				
	66/67	67/68	68/69	69/70	Total Active Majors	70/71	71/72	72/73	73/74	74/75
Industrial										
General (Only) Certification										
Central Michigan University	35	40	70	99	264	104	94	105	121	132
Eastern Michigan University	22	28	20	25	--[b]	30	30	30	30	30
Michigan State University	12	22	21	29	144	29	34	34	34	34
Northern Michigan University	30	44	51	67	--[b]	79	81	81	87	87
Wayne State University	11	12	12	12	97	19	22	27	31	37
Western Michigan University	67	63	93	121	--[b]	148	149	155	162	219
TOTAL	177	209	267	353	505[f]	409	410	432	465	539

[a]Includes those gaining Vocational Certification and those qualifying for both Vocational and General Provisional Certification.

[b]Data not reported by institution.

[c]From Annual NEA Teacher Supply & Demand Data.

[d]Reported by institution as NA.

[e]Incomplete - Lacks Post BA/BS Route Outputs

[f]Total incomplete due to the above.

[g]Curriculum changes to Dual Certification.

[h]Includes Health Occupations (7).

[i]Includes Health Occupations (14).

[j]Incomplete - Lacks BA/BS Route.

inservice teachers, that about 90% of these were in the area of business education, and that almost all of those in business education were enrolled at two universities. There were few inservice teachers working toward initial certification in agricultural, home economics, and industrial education (43).

An effort was made to determine the extent of minors currently enrolled in vocational and practical or applied arts programs, since there seems to be a great deal of concern about the professional adequacy of the person with only a minor in vocational subjects. A minor is sufficient academic qualification for vocational certification, according to the Certification Code. Responses to this question were very spotty, which may mean that there are very few people in training as minors, but more likely it means that there is essentially no way readily to determine this kind of information within many teacher education institutions. It is known, however, that increasing numbers of college students seeking to choose a marketable minor have been advised by academic counselors to choose high demand, low supply subjects. As a result, increasing numbers have shown interest in vocational and practical or applied arts minors. It is also known that some institutions have directly discouraged students from attempting minors, and at least one department has eliminated the minor completely.

Specializations

It is not enough to determine supply outputs by occupational areas at the level of specificity, as was furnished in the previous section, since teacher demand is usually more specific as to specialities. This is particularly so in industrial education, where there are scores of occupational specializations. Hence, teacher education department chairmen were asked to furnish detail as to the specializations possessed by their outputs for 1969/70 and 1970/71. In addition, they were asked to indicate anticipated trends in the next five years as to whether they expected the particular specialities offered in their departments to increase, remain the same, decrease, or no opinion. These data are presented as Table 49, and are arranged into four groups along the major occupational service divisions, agriculture, business, home economics, and industrial. The outputs of each institution are noted.

At one time in this study it was hoped that the specializations offered by institutions could be fit into

TABLE 49.--VOCATIONAL-TECHNICAL & PRACTICAL ARTS INITIAL CERTIFICATION OUTPUTS, BY SPECIALIZATION 1969/70-1970/71

Specializations Available	1969/70									1970/71									Anticipated Trends Next Five Years		
	CMU	EMU	FSC[a]	MSU	NMU	UM	WSU	WMU	T	CMU	EMU	FSC[a]	MSU	NMU	UM	WSU	WMU	T	Increase	Same	Decrease
Agriculture[b]																					
Business																					
Vocational Certification[c]																					
General (Basic) Business	--	--	9	--	--	--	78	92[a]	179	--	--	12	--	--	--	71	115[a]	198	--	3	1
Distributive Education	40	25	5	18	--	--	25	15[a]	128	58	33	7	15	6	--	15	14[a]	148	2	7	--
Office Education	35	5	--	50	--	--	--	--	90	40	5	--	93	9	--	--	--	147	3	2	--
Accounting	--	--	12	--	--	--	--	--	12	--	--	9	--	--	--	--	--	9	1	--	--
Secretarial/Steno	--	--	9	--	--	--	18	25[a]	52	--	--	12	--	--	--	18	29[a]	59	1	2	--
Data Processing	--	--	--	--	--	--	15	--	15	2	--	--	--	--	--	20	--	22	1	--	--
Typing & Machines	--	--	--	--	--	--	--	53a	53	--	--	--	--	--	--	--	76[a]	76	1	--	--
Composite Major & Minor	--	--	--	--	--	--	--	--	--	4	--	--	--	--	--	--	--	4	1	--	--
Teacher Coordinator	--	--	--	--	--	--	--	21[a]	21	--	--	--	--	--	--	--	29[a]	29	1	--	--
Other & Not Specified	--	34	--	--	1	12[d]	121	--	168	8	38	--	--	--	5[d]	151	--	202	--	--	--
TOTAL	75	64	35	68	1	12[d]	257	206[a]	718	112	76	40	108	15	5[d]	275	263[a]	894	11	14	1
Business																					
General (Only) Certification																					
General (Basic) Business	15	--	9	--	--	--	--	--	24	15	--	13	--	--	--	--	--	28	--	1	--
Distributive Education	5	20	5	--	21	--	--	--	51	2	19	8	--	18	--	--	--	47	--	1	--
Office Education	5	41	--	59	24	--	--	--	129	1	37	--	34	28	--	--	--	100	--	1	--
Accounting	--	--	12	--	14	--	--	--	26	--	--	11	--	7	--	--	--	18	--	--	--
Secretarial/Steno	--	--	9	--	--	--	--	--	9	--	--	13	--	--	--	--	--	13	--	--	--
Data Processing	--	--	--	--	--	--	--	--	--	2	--	--	--	--	--	--	--	2	1	--	--
Composite Major & Minor	--	--	--	--	--	--	--	--	--	2	--	--	--	--	--	--	--	-2	1	--	--
Other & Not Specified	--	--	--	--	5	--	--	32	37	--	--	--	--	--	--	--	27	27	--	--	--
TOTAL	25	61	35	59	64	--	--	32	276	22	56	45	34	53	--	--	27	237	2	3	--

TABLE 49.--Continued

Specializations Available	1969/70									1970/71									Anticipated Trends Next Five Years		
	CMU	EMU	FSC	MSU	NMU	UM	WSU	WMU	T	CMU	EMU	FSC	MSU	NMU	UM	WSU	WMU	T	Increase	Same	Decrease
Home Economics Vocational Certification[c]																					
Home Ec & Family Life	35	35	--	110	20	--	40	94	334	36	45	--	110	18	--	43	120	372	2	--	--
Foods & Nutrition	--	3	--		--	--			3	--	2	--		--	--			2	--	--	--
Clothing & Textiles	--	2	--		--	--			2	--	1	--		--	--			1	--	--	--
Consumer Education	--	1	--		--	--			1	--	3	--		--	--			3	1	--	--
Housing & Home Furnishings	--	--	--		--	--			--	--	1	--		--	--			1	--	--	--
Family Life	4	--	--		--	--			4	4	--	--		--	--			4	2	--	--
Occupational Foods	--	--	--		4	--			4	--	--	--		3	--			3	1	--	--
Occupational Child Devel.	--	--	--		1	--			1	--	--	--		1	--			1	1	--	--
Health Related Occupations	--	--	--		--	--			--	--	--	--		1	--			1	1	--	--
Clothing & Related Occ.	--	--	--		3	--			3	--	--	--		2	--			2	1	--	--
Other & Not Specified	1	5	--		--	--			6	2	7	--		--	--			9	--	--	--
TOTAL	40	46	--	110	28	--	40	94	358	42	59	--	110	25	--	43	120	399	9	--	--
Home Economics General (Only) Certification																					
Gen. Home Ec & Family Life	1	6	--	--	0	--	0	--	7	0	12	--	--	0	--	0	0	12	2	--	--

No Specializations

TABLE 49.--Continued.

Specializations Available	1969/70									1970/71									Anticipated Trends Next Five Years		
	CMU	EMU	FSC	MSU	NMU	UM	WSU	WMU	T	CMU	EMU	FSC	MSU	NMU	UM	WSU	WMU	T	Increase	Same	Decrease
Industrial Vocational Certification[c]	--	--	--	--	--	--	2	--	2	--	--	--	--	--	--	1	--	1	--	1	--
Aircraft	1	--	16	--	3	--	4	2	26	3	--	15	--	3	--	9	3	33	4	--	--
Auto Mechanics	--	--	--	--	--	--	2	--	2	--	--	--	--	--	--	2	--	2	--	1	--
Auto Body Design	--	--	--	--	--	--	1	--	1	--	--	--	--	--	--	--	--	--	1	--	--
Auto Body Repair	--	--	6	--	--	--	--	--	6	--	--	11	--	--	--	--	--	11	--	--	1
Heavy Equipment & Diesel	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	1	--	--
Electricity	1	--	--	--	--	--	3	1	7	3	--	8	--	--	--	6	2	19	3	1	--
Electronics	--	--	3	--	--	--	--	--	2	--	--	--	--	3	--	--	--	3	--	--	--
Electrical/Electronics	--	--	--	--	2	--	--	--	5	--	--	5	--	--	--	--	--	5	1	--	--
Refrig., Air Cond., & Heat.	--	--	5	--	--	--	--	--	12	3	--	5	--	3	--	--	3	14	3	--	--
Drafting-Technical	--	--	8	--	2	--	--	2	1	--	--	--	--	--	--	--	--	--	--	1	--
Drafting-Architectural	--	--	--	--	--	--	--	1	13	--	--	12	--	--	--	2	2	16	2	2	--
Printing/Graphics	--	--	11	--	--	--	1	1	1	--	--	--	--	--	--	--	1	1	--	1	--
Cabinet Making	--	--	--	--	--	--	--	1	4	3	--	--	--	--	--	--	2	5	2	--	--
Carpentry	2	--	--	--	--	--	--	2	1	--	--	--	--	--	--	--	--	--	--	1	--
Model & Wood Pattern Maker	--	--	--	--	--	--	1	--	1	--	--	--	--	--	--	--	12	22	1	--	1
Machine Tool	--	--	14	--	--	--	--	14	28	--	--	10	--	--	--	--	--	4	1	1	--
Welding	--	--	--	--	2	--	2	--	4	2	--	--	--	2	--	--	3	3	--	1	--
Die Design	--	--	--	--	--	--	2	--	2	--	--	--	--	--	--	--	5	5	--	1	--
Die Maker	--	--	--	--	--	--	4	--	4	--	--	--	--	--	--	--	7	7	1	--	--
Tool Design	--	--	--	--	--	--	3	--	3	--	--	--	--	--	--	--	13	13	--	1	--
Tool Maker	--	--	--	--	--	--	6	--	6	--	--	--	--	--	--	--	1	1	--	1	--
Pipe Fitter	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Building Construction	--	--	--	--	3	--	--	--	3	--	--	--	--	3	--	--	--	3	--	--	--
Commercial Food	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	1	1	--	--
Cosmetology	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	1	--	--	--
Health	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	1	--	--	--
Coordinator	--	--	--	--	--	--	2	--	2	--	--	--	--	--	--	4	--	4	1	--	--
Power & Energy Systems	1	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Graphics Communic. & Design	--	↑	--	--	--	--	--	--	↑	--	↑	--	--	--	--	--	--	↑	--	--	1
Mat. Proc. - Mfg. & Constr.	--	18	--	--	--	--	--	--	18	--	22	--	--	--	--	--	--	22	--	--	--
Other & Not Specified	--	↓	--	--	--	--	--	--	↓	--	↓	--	--	--	--	--	--	↓	1	--	--
TOTAL	3	--	1	3	1	--	--	3	11	7	--	4	9	3	--	--	8	31	--	--	--
	8	18	64	3	13	--	33	27	166	21	22	70	9	17	--	55	33	227	24	14	3

TABLE 49.--Continued.

Specializations Available	1969/70									1970/71									Anticipated Trends Next Five Years		
	CMU	EMU	FSC	MSU	NMU	UM	WSU	WMU	T	CMU	EMU	FSC	MSU	NMU	UM	WSU	WMU	T	Increase	Same	Decrease
Industrial																					
General (Only) Certification																					
General Industrial Arts	--	↑	--	29	--	--	12	32	73	--	↑	--	29	--	--	19	40	88	3	--	--
Power & Energy Systems	29	↑	--	--	--	--	--	--	29	27	↑	--	--	--	--	--	--	27	--	1	--
Graphics Communic. & Design	28	25	--	--	--	--	--	--	53	31	30	--	--	--	--	--	--	61	--	--	1
Mat. Proc. - Mfg. & Constr.	24	↓	--	--	--	--	--	--	24	28	↓	--	--	--	--	--	--	28	1	--	--
Contemporary Industry	17	--	--	--	--	--	--	--	17	13	--	--	--	--	--	--	--	13	--	--	--
Electricity/Electronics	--	--	--	--	8	--	--	6	14	--	--	--	--	10	--	--	7	17	--	2	--
Metalworking	--	--	--	--	--	--	--	13	13	--	--	--	--	--	--	--	17	17	--	1	--
Woodworking	--	--	--	--	0	--	--	10	10	--	--	--	--	0	--	--	12	12	1	1	--
Drawing	--	--	--	--	20	--	--	36	56	--	--	--	--	23	--	--	43	66	1	1	--
Graphic Arts & Printing	--	--	--	--	6	--	--	5	11	--	--	--	--	7	--	--	5	12	1	1	--
Power & Auto Mechanics	--	--	--	--	10	--	--	13	23	--	--	--	--	12	--	--	16	28	2	--	--
Machine Shop	--	--	--	--	11	--	--	--	11	--	--	--	--	13	--	--	--	13	1	--	--
Building Construction	--	--	--	--	12	--	--	--	12	--	--	--	--	14	--	--	--	14	--	1	--
Other & Not Specified	1	--	--	--	--	--	--	6	7	5	--	--	--	--	--	--	8	13	--	--	--
TOTAL	99	25	--	29	67	--	12	121	353	104	30	--	29	79	--	19	148	409	10	8	1

[a]Figures derived.

[b]Specialization data unavailable.

[c]Includes those gaining Vocational Certification and those qualifying for both Vocational and General Provisional Certification.

[d]From Annual NEA Teacher Supply & Demand Data.

the occupational subclassifications furnished by the U.S. Office of Education, but due to the great variety of ways of circumscribing specialization this hope was not realized. Instead the specializations listed in the table were taken directly from institutional terminology, with condensations being made wherever appropriate. One of the more pressing needs is the realignment of occupational majors and minors or specializations along some sort of agreed-upon taxonomy, such as the United States Office of Education code of classifications. Some steps are already being taken in this direction in Michigan. For example, vocational teacher certification records have been reorganized along seven major groupings of the United States Office of Education code (80). Programs and record keeping at the teacher education institution ought to move more rapidly toward the realization of this or on some other agreed-upon common system of classification.

Graduate Degree Outputs

University contact persons and department heads were asked to furnish past and anticipated outputs plus current enrollments of their higher degree programs, namely, Master's, Specialist, and Doctoral. The following tables present these data; Table 50 has the output by degrees with breakdown as to subject field; Table 51 has composite output by degree type with the total output of each institution listed therein. It is important to notice here that a category of common or across-the-board vocational-technical education has been included, in that a significant number of persons are doing graduate work along these lines. A third table (Appendix 11) presents higher degree outputs by each institution.

Private College Outputs

It is surprising to note the number of new teachers being certified through programs in Michigan's private colleges. Table 52 shows the output for 1968/69 by subject. These data were collected from college registrars by the Michigan Department of Education, in cooperation with the National Education Association and its annual teacher supply and demand study. Table 53 shows the total output by year over the past five years.

TABLE 50.--GRADUATE DEGREE OUTPUTS, BY OCCUPATIONAL AREA 1967/68-1974/75

Higher Degree Programs	Past Outputs - Completions			Current Enrollments	Anticipated Outputs				
	67/68	68/69	69/70	Total Active[a]	70/71	71/72	72/73	73/74	74/75
Master's									
Agriculture	24	23	8	103	15	20	15	20	15
Business	99	139	167	796[b]	198	223	247	267	289
Home Economics	55	51	55	424	67	83	92	100	110
Industrial	142	175	212	986	173	190	221	239	261
Common	11	13	15	125	15	25	35	45	55
TOTAL	331	401	457	2434[c]	468	541	610	671	730
Specialist									
Agriculture	0	0	0	2	0	1	0	1	0
Business	2	3	5	39[b]	7	11	12	13	14
Home Economics	0	0	0	0	1	0	4	4	6
Industrial	2	3	4	49	6	10	13	16	20
Common	0	0	2	17	4	13	24	34	44
TOTAL	4	6	11	107[c]	18	35	53	68	84
Doctoral									
Agriculture	4	3	5	12	3	4	3	3	3
Business	9	9	14	18[b]	18	20	17	19	28
Home Economics	1	2	3	4	2	2	1	1	1
Industrial	1	5	4	50	9	9	9	8	7
Common	2	1	2	18	5	5	14	18	16
TOTAL	17	20	28	102[c]	37	40	44	49	55

[a]Active = Enrolled once (or more) during past year

[b]Occupational area total incomplete due to incomplete report from one institution

[c]Total incomplete due to above

TABLE 51.--GRADUATE DEGREE OUTPUTS, BY INSTITUTION, 1967/68-1974/75

Higher Degree Programs	Past Outputs - Completions			Current Enrollments	Anticipated Outputs				
	67/68	68/69	69/70	Total Active[a]	70/71	71/72	72/73	73/74	74/75
Master's									
Central Michigan University	19	31	39	129	47	54	79	89	106
Eastern Michigan University	40	61	71	389	74	81	90	96	103
Michigan State University	83	92	77	324[b]	83	89	84	89	84
Northern Michigan University	27	22	42	188	32	38	44	47	56
University of Michigan	11	13	15	125	15	25	35	45	55
Wayne State University	97	126	135	562	114	133	153	172	189
Western Michigan University	54	56	78	717	103	121	125	133	137
TOTAL	331	401	457	2434[c]	468	541	610	671	730
Specialist									
Central Michigan University	0	1	1	2	2	2	2	2	2
Eastern Michigan University	0	0	1	30	Being Discontinued				
Michigan State University	1	2	2	14[b]	6	10	10	11	11
University of Michigan	0	0	2	10	2	10	20	30	40
Wayne State University	3	3	4	32	6	10	14	18	22
Western Michigan University	0	0	1	19	2	3	7	7	9
TOTAL	4	6	11	107[c]	18	35	53	68	84
Doctoral									
Michigan State University	13	12	18	60[b]	26	25	24	26	31
University of Michigan	1	0	1	10	2	3	6	8	8
Wayne State University	3	8	9	32	9	12	14	15	16
TOTAL	17	20	28	102[c]	37	40	44	49	55

[a]Active = Enrolled once (or more) during past year

[b]Institutional total incomplete due to incomplete report from one occupational area

[c]Total incomplete due to above

TABLE 52.--INITIAL TEACHING CERTIFICATES BY PRIVATE COLLEGES, 1968/69

Private Colleges	Bus. Ed.			D.E.			Home Ec			Ind. Arts			TOTALS		
	B[a]	M[b]	T[c]	B	M	T	B	M	T	B	M	T	B	M	T
Adrian	3	0	3	-	-	-	8	0	8	-	-	-	11	0	11
Albion	-	-	-	-	-	-	3	0	3	-	-	-	3	0	3
Alma	2	0	2	-	-	-	-	-	-	-	-	-	2	0	2
Andrews	1	0	1	-	-	-	15	0	15	6	0	6	22	0	22
Aquinas	4	0	4	-	-	-	-	-	-	-	-	-	4	0	4
Calvin	4	0	4	-	-	-	-	-	-	-	-	-	4	0	4
Grand Valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hillsdale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hope	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kalamazoo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Madonna	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marygrove	0	4	4	-	-	-	2	3	5	-	-	-	2	7	9
Mercy	-	-	-	-	-	-	3	0	3	-	-	-	3	0	3
Nazareth	-	-	-	-	-	-	1	0	1	-	-	-	1	0	1
Olivet	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sienna	-	-	-	-	-	-	1	0	1	-	-	-	1	0	1
Spring Arbor	1	0	1	-	-	-	-	-	-	-	-	-	1	0	1
U. of Detroit	-	-	-	2	0	2	2	0	2	-	-	-	4	0	4
TOTALS	15	4	19	2	0	2	35	3	38	6	0	6	58	7	65

[a]B = Bachelor's degree [b]M = Master's degree [c]T = TOTAL

Note: No agriculture or T&I.

Source: Michigan Data for NEA Teacher Supply & Demand in Public Schools Study, Michigan Department of Education.

TABLE 53.--PRIVATE COLLEGE OUTPUTS IN VOCATIONAL AND APPLIED ARTS

Year	Number
1966/67	39
1967/68	78
1968/69	65
1969/70	80
1970/71	58*

*Estimate.

The majority of these new teachers possess general secondary provisional certificates. Only Albion College, Mercy College, and Madonna College are approved for vocational certification in home economics education. None of the institutions is approved for vocational certification in any of the other occupational areas. These private colleges, however, do constitute a potential source of personnel for vocational programs, since it is likely that with additional work experience and course work, many of them would qualify.

Attrition Rates

Usually many persons who complete teacher education programs do not enter teaching the subsequent year, regardless of supply and demand. A sizeable number, albeit a minority, enter nonteaching occupations, including military service, homemaking, and continuation of formal education. Studies which have been made to determine the percentage of eligible graduates who actually go into teaching have been plagued with the large proportion for whom there are no follow-up data.

The NEA teacher supply and demand data for 1970 include follow-up information on the placement of 1968/69 graduates. The original Michigan information was sent to university department chairmen, with a request to update it with special attention to those who had been listed in the "No Information" column. Some chairmen assisted in this matter (Table 54). Fifty-eight per cent of the graduates in vocational and practical arts fields took teaching positions, 25% were classified as "not teaching," and for 17% there was no information. The range for those known to have gone into teaching was from 71% for

TABLE 54.--OCCUPATION, ON NOVEMBER 1, 1970, OF PERSONS COMPLETING PREPARATION BETWEEN SEPTEMBER 1, 1969, AND AUGUST 31, 1970 WITH QUALIFICATIONS FOR STANDARD CERTIFICATES BY TEACHING SUBJECT

Field of Preparation		Teaching				Not Teaching											No Information		TOTALS		
		In-state		Out-state		Otherwise Gainfully Employed		Continuing Formal Study		Military Service		Home-making	Seeking Teaching Position		Seeking Non-Teaching Job						
		Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Women	Men	Women	Men	Women	Men	Women	Men	Women	TOTAL
Agriculture	N	21	2	1	0	3	1	2	--	1	--	--	--	--	--	--	3	--	31	3	34
	%	61.8	5.9	2.9	--	8.8	2.9	5.9	--	2.9	--	--	--	--	--	--	8.8	--	91.2	8.8	100.0
Business	N	142	137	17	20	29	28	22	18	17	--	13	19	13	1	1	88	69	335	299	634
	%	22.4	21.6	2.7	3.2	4.6	4.4	3.5	2.8	2.7	--	2.0	3.0	2.0	0.2	0.2	13.9	10.9	52.8	47.2	100.0
Home Economics	N	--	178	--	13	--	16	--	14	--	2	23	--	38	--	1	--	37	--	322	322
	%	--	55.3	--	4.0	--	5.0	--	4.3	--	0.6	7.1	--	11.8	--	0.3	--	11.5	--	100.0	100.0
Industrial	N	224	--	34	--	29	--	18	--	18	--	--	9	--	--	--	29	1	361	1	362
	%	61.9	--	9.4	--	8.0	--	5.0	--	5.0	--	--	2.5	--	--	--	8.0	0.3	99.7	0.3	100.0
TOTALS	N	387	317	52	33	61	45	42	32	36	2	36	28	51	1	2	120	107	727	625	1352
	%	28.6	23.4	3.8	2.4	4.5	3.3	3.1	2.4	2.7	0.1	2.7	2.1	3.8	0.1	0.1	8.9	7.9	53.8	46.2	100.0

Source: Updated NEA (Michigan) Supply and Demand Data

agriculture and industrial, to 50% in business, with home economics reporting 59%. It is important to recognize that the percentage of those entering teaching is somewhat higher than reported here, since some of the individuals for whom there was no information likely did take teaching jobs, perhaps one-third of them. Also, the "seeking teaching position" category contained within the "not teaching" group must be included: it amounted to 6%. For purposes of this report, in projecting supply and demand for vocational-technical personnel in the 70's, it will be assumed that a composite of 70% of those graduating will be available to go into teaching. This, of course, will vary with the subject area, with economic conditions, and other factors.

National data prepared by the NEA and covering forty-five states show 58.3% went into vocational and practical or applied arts teaching, 20.4% entered non-teaching endeavors, and for 21.3% there was no information (43). The range of persons going into teaching was from a high of 69% in distributive education to a low of 41% in trade and industry. At the same time the percentage of all secondary subject graduates going into teaching was 62.3%. It is interesting to note that the 62.3% represents a steady decline from the 69% doing so in 1962.

The quantity of new graduates moving to outstate teaching positions is also noteworthy, since approximately 11% of those actually entering teaching do so outstate. This varies from 13% in industrial education to 4% in agriculture, with business at 12% and home economics at 7%. It is important to note that nearly half of these quantities were reported from Northern Michigan University, and that about 85% were reported by Northern Michigan, Michigan State, and Western Michigan universities.

It is interesting to speculate as to whether or not Michigan will gain vocational teachers through the emigration and immigration processes. It is probable that Michigan will at least hold its own and perhaps gain a few vocational teachers, since it has been above the national average in economic activity, population growth, and in conditions of service for teachers.

Existing System of Teacher Education

Focus of Responsibility

Tradition has it that the responsibility for teacher education is that of the state colleges and universities; at least, that is the popular concept. Most

FIGURE 11.--LOCATION OF MICHIGAN'S PUBLIC VOCATIONAL-TECHNICAL TEACHER EDUCATION COLLEGES AND UNIVERSITIES

CENTRAL MICHIGAN UNIVERSITY
EASTERN MICHIGAN UNIVERSITY
FERRIS STATE COLLEGE
MICHIGAN STATE UNIVERSITY
NORTHERN MICHIGAN UNIVERSITY
UNIVERSITY OF MICHIGAN
WAYNE STATE UNIVERSITY
WESTERN MICHIGAN UNIVERSITY

of the ills of inadequate teacher supply in terms of quality and quantity are laid at the door of teacher educators. Only occasionally are brickbats thrown at others; school administrators, state office personnel, and leaders of professional organizations. Fortunately, a new concept of responsibility is developing. This emerging concept holds that responsibility for teacher education and personnel development must be shared by teacher education institutions, employers of professional personnel, State (including Federal) Department of Education, professional organizations, and individual professionals themselves. Further refinement of this shared responsibility concept can be made along lines of preservice and inservice education. Although all the entities named above share some responsibility for preservice personnel development, the primary focus rests on teacher education institutions. As to inservice professional development, primary responsibility belongs with the employers and the individual professionals, with considerable assistance from teacher-education institutions and the State Office. Coordinating all of this, plus long-range planning and promotion of financial resources, is a responsibility of the State Department of Education.

The present situation in Michigan is somewhere between the traditional concept and the emerging viewpoint, with movement clearly toward the latter. Teacher educators are glad to share the overall responsibility. Interviews with administrators indicate assumption of a larger degree of responsibility for the professional development of inservice teachers than was true in the past. A commitment has been made by the State Department of Education to assume responsibility for coordinating professional development activities in vocational-technical education, and this report is intended to assist in development of a long-range state plan for personnel development.

History of Program Authorization

One of the many interesting pursuits in the course of this study was the review of minutes of meetings of the State Board of Control for Vocational Education and subsequently the State Board of Education, covering the period from 1917 to the present, in order to locate official dates of program approvals. This search revealed formal approval dates of vocational teacher education programs at Michigan institutions in the various vocational fields (Table 55). Figure 11 shows the institution locations.

TABLE 55.--VOCATIONAL-TECHNICAL TEACHER EDUCATION PROGRAM APPROVALS BY STATE BOARD OF EDUCATION,[a] 1917-1970

Institution	Agriculture	Distributive Education	Home Economics	Office Education	Trade & Industry	Counselor
Public						
Central Michigan University		1964	1938	1964	1970	1954
Eastern Michigan University		1964	1917	1964	1963	1960
Ferris State College		1964		1964	1962	
Michigan State University	1917	1953	1917	1964	1953	1945
Northern Michigan University		1964	1937	1960	1960	1956
University of Michigan		1961[b]		1964[b]	1917	1948
Wayne State University		1961	1937	1961	1954	1958
Western Michigan University		1946	1937	1964	1954	1957
Private						
Albion College			1949			
Madonna College			1969			
Mercy College			1960			
TOTAL[c]	1	7	9	7	8	7

[a]State Board of Control for Vocational Education through 1964, State Board of Education since then.

[b]Approval withdrawn 1970.

[c]Totals in effect 1970/71.

Health occupations authorization is conspicuous by its absence. (MSU had a health occupations specialist briefly in the late 1950's, but this authorization was probably subsumed within trade and industry.) All public institutions have been approved for trade and industry, while home economics holds the most with nine public and private institutions having been approved. Distributive, office, and vocational counselor programs have each been approved at seven state universities.

Programs Offered

An inventory of teacher education degree programs offered by Michigan public universities appears in Table 56. It is significant to note that there are no programs in health occupations. Also of significance is the nature of programs at University of Michigan at all levels, which is characterized as common or across-the-board vocational teacher education, termed "occupational education." An under-graduate curriculum of this nature is scheduled for 1971/72. Major emphasis is to be on the common competencies of all occupational teachers and other personnel, rather than upon separate subjects. This is part of a discernible national trend toward emphasis upon common competencies and development of "occupational educators." The graduate program in leadership development for occupational educators offered by the University of Michigan is illustrative of this emphasis. The other institution having a record of graduate programs in common, vocational-technical education is Michigan State University, which has formalized programs of this type at the specialist and doctoral levels. Beginning with the fall of 1971, Michigan State University will conduct an EPDA subsidized doctoral leadership program which is intended to provide the same emphasis.

Institutional Organization

Vocational-technical personnel development units in Michigan universities are found to have a wide variety of organizational patterns. These organizations have no doubt developed for a broad range of theoretical and pragmatic reasons; each in its own way and in its own circumstances goes about accomplishing the business before it. Some of these organizations tend to be atomistic, in the sense that the various occupational teacher education departments exist in different colleges and tend to carry on their activities separated from each other in terms of budget, lines of authority, and program.

TABLE 56.--INVENTORY OF VOCATIONAL-TECHNICAL PERSONNEL DEVELOPMENT PROGRAMS OFFERED IN MICHIGAN PUBLIC UNIVERSITIES, 1970/71[a]

University	Bachelor's						Master's						Specialist						Doctoral					
	01 Agric.	04/14 D.E. & O.E.	07 Health	09 Home Ec	16/17 Tech. & Trade	Occupational Ed.[b]	01 Agric.	04/14 D.E. & O.E.	07 Health	09 Home Ec	16/17 Tech. & Trade	Occupational Ed.	01 Agric.	04/14 D.E. & O.E.	07 Health	09 Home Ec	16/17 Tech. & Trade	Occupational Ed.	01 Agric.	04/14 D.E. & O.E.	07 Health	09 Home Ec	16/17 Tech. & Trade	Occupational Ed.
C.M.U.		X		X	X			X		X	X						X							
E.M.U.		X		X	X			X		X	X						X[c]							
F.S.C.		X			X																			
M.S.U.	X	X		X	X		X	X		X	X		X	X		X	X	X	X	X		X	X	X
N.M.U.		X		X	X			X		X	X													
U.M.		X[d]			X[d]						X	X					X	X					X	X
W.S.U.		X		X	X			X		X	X			X			X			X			X	
W.M.U.	X	X		X	X			X		X	X			X										

[a]Determined by reports of active enrollees from department chairmen.

[b]Common, "across-the-board," unified vocational education.

[c]Being discontinued.

[d]Inactive 1970/71.

At the other end of the spectrum are those institutions which have all the occupational areas within a single department, division, or college. It is important to note that there is a national trend toward the latter type of organization. It is felt that it provides better visibility, as well as facilitating a unified vocational personnel development function. Theoretically, unitary organization makes it possible to respond more rapidly to various personnel development needs and to effect some operational economies. Three institutions have organized their occupational service areas into single administrative units within the colleges of education. These are Ferris State College, University of Michigan, and Wayne State University. Until the past year Michigan State University was so organized, but home economics teacher education was then transferred to the College of Human Ecology (home economics).

Four institutions have organizational patterns in which business education is located in the schools or colleges of business, while the other occupational areas are situated elsewhere. At Central Michigan University the home economics and industrial departments are located in the School of Fine and Applied Arts; at Eastern Michigan University industrial education and home economics departments belong to a group of units entitled Applied Science Departments, which individually report directly to the top administration; at Northern Michigan University home economics and industrial education departments are located in the College of Education; and at Western Michigan University distributive, home economics, and industrial education are within the College of Applied Sciences. Each institution has some form of vocational teacher education coordinating group, with representation from each department, which is usually under the chairmanship of the institution's designated vocational contact person. These groups can be very effective in facilitating communications and coordinating activities, but some appear to fall short of this goal.

Trends in Undergraduate Preservice Program Inputs

University department chairmen interviewed to determine the sources of undergraduate student inputs indicated that in their experience the proportion of high school matriculants directly entering vocational and practical or applied arts teacher education has been decreasing markedly. On the other hand, external transfers, that is, individuals from other two- and four-year

institutions, have been increasing sharply. A third source of input, internal transfers, that is, individuals changing curricula within the institution, are on the increase but not nearly at the rate of external transfers.

Presently, about half of the input is the direct high school entrant, while the internal transfer and external transfer are nearly equal. On a composite basis it can be expected that the external transfer will increase in proportion, at the expense of the direct high school graduate, and the internal transfer is likely to increase only slightly. This prediction is based in part upon the fact that various Michigan teacher education institutions are planning new programs to capitalize upon the community college associate degree student as a fertile input source. Furthermore, state planning and financing will likely support shifting a greater share of college enrollments from four-year institutions to community colleges.

Field Service Operations

Field services are offered primarily for inservice personnel by all state institutions, excepting Ferris State College. Table 57 furnishes an analysis of field service offerings by occupational service areas for a two-year period, 1969/70 through 1970/71. A total of 175 courses carrying 349 semester hours credit was offered. Approximately 75% were in professional education, as contrasted with technical subject matter specialties. The average class size was 22. The most active institution was the University of Michigan, followed by Central Michigan University, Northern Michigan University, and Michigan State University, in that order. Western Michigan University, Eastern Michigan University, and Wayne State University offered considerably fewer field courses during that period. Wayne State University and Eastern Michigan University, because of their location in the heavily populated southeastern corner of Michigan, state that their clientele are able to reach campus centers; therefore these institutions do not need to offer as much off-campus. This is because of shorter traveling distances, good roads, and, in the case of Wayne State University, little interest in and resources for serving needs outside of the three-county area of Wayne, Oakland, and Macomb. The four former state teachers' colleges, Central Michigan University, Eastern Michigan University, Northern Michigan University, and Western Michigan University, have been regarded as regional institutions and through the

TABLE 57.--ANALYSIS OF FIELD SERVICE COURSES BY UNIVERSITY, 1969/70-1970/71

	Number of Courses	Semester Credit Hours
Central Michigan University	33	62
Eastern Michigan University	14	28
Ferris State College	0	0
Michigan State University	28	58
Northern Michigan University	29	58
University of Michigan	51	102
Wayne State University	5	13
Western Michigan University	15	28
TOTAL	175	349

years have developed agreements for servicing specific districts of the state. Figure 12 shows the areas of the state serviced through this regional concept.

Michigan State University and the University of Michigan have traditionally serviced professional development and consultation needs throughout the state. Both have the heritage of being designated as original vocational teacher education institutions, Michigan State University in agricultural and home economics education and the University of Michigan in trade and industrial. (Eastern Michigan University was designated in home economics at the same time.) In former decades both institutions offered courses in Michigan's upper peninsula, but recently both have curtailed these activities except for unusual circumstances, leaving the responsibility for the upper peninsula primarily in the hands of Northern Michigan University.

It should be clear that not all institutions offer off-campus courses in all of their occupational service areas. For example, field service courses for home economics teachers are reported by only three of six designated public institutions. The number of courses being offered as appropriate for all occupational teachers under the heading of "Common" in Table 58 is significant. Small numbers of clientele from a single occupational service area in a specific geographic district make the offering of specialized courses less than feasible in

FIGURE 12.--FIELD SERVICE DISTRICTS OF CENTRAL, EASTERN, NORTHERN, AND WESTERN MICHIGAN UNIVERSITIES

TABLE 58.--ANALYSIS OF FIELD SERVICE COURSES BY OCCUPATIONAL FIELD, 1969/70-1970/71

	Number of Courses	Semester Credit Hours
Agriculture	3	8
Business	22	52
Health	0	0
Home Economics	23	32
Industrial	45	93
Common	82	164
TOTAL	175	349

many situations. This has caused institutions to offer more courses of a common, across-the-board nature in order to draw sufficient quantities of students to make their operations more nearly financially viable.

Special Workshops and Institutes for Vocational-Technical Education Personnel

During the two-year period, 1969/70 through 1970/71, 243 special workshops and institutes were provided by Michigan vocational-technical teacher education institutions. The institutions included all except Ferris State College, which did not report any such programs, but is known to have offered them during this period of time. These workshops and institutes were primarily designed for inservice personnel, and they usually focused on topics of contemporary concern. They probably came closer to meeting felt needs of vocational educators than did regular courses.

Table 59 presents a composite of workshops and institutes by occupational areas and companion Table 60 reports the same information by institutions. It can be noted that Western Michigan University, Michigan State University, Central Michigan University, and Wayne State University have supplied quite a concentration of these educational experiences. Fifty-five percent were financed entirely with institutional funds, seventeen percent with external funds alone, and twenty-eight percent combined internal and external funds. Workshops averaged

TABLE 59.--ANALYSIS OF WORKSHOPS AND INSTITUTES BY OCCUPATIONAL FIELDS, 1969/70-1970/71

	Number of Workshops
Agriculture	13
Business	58
Health	0
Home Economics	72
Industrial	67
Common	33
TOTAL	243

TABLE 60.--ANALYSIS OF WORKSHOPS AND INSTITUTES 1969/70-1970/71 COMPOSITE BY UNIVERSITY

	Number of Workshops
Central Michigan University	46
Eastern Michigan University	22
Ferris State College	0
Michigan State University	47
Northern Michigan University	25
University of Michigan	10
Wayne State University	39
Western Michigan University	54
TOTAL	243

thirty-eight students in attendance; ninety-four percent were on-campus. Three-fourths of them dealt with professional education topics.

Attention to Special Needs

With exceptions, very little is being done by vocational-technical teacher education departments to conduct workshops and short courses for meeting the needs of personnel who work with the handicapped and disadvantaged.

Less than four percent of the workshops offered by vocational-technical teacher education departments (1969/70 through 1970/71) dealt with Special Needs themes. For some reason the federal and state priorities which emphasize vocational-technical education for disadvantaged and handicapped have not yet been picked up significantly by teacher educators. Perhaps the difficulty is connected to the need for acquiring staff competencies in these areas and/or securing financial resources to be able to offer such programs. Only one of the teacher education projects for 1970/71 was in the Special Needs area, with reference to the vocational-technical teacher education project funds administered through the State Vocational Education Services office. Each institution makes decisions about the nature of the projects it undertakes with its share of the fund.

Inservice Activities of School Units

Orientation Programs

Orientation programs for vocational-technical teachers at the secondary and post-secondary levels tend to be short (or nonexistent), usually taking the form of a one- to three-day orientation period at the beginning of the school year. Formal orientation usually ceases at that point, but some schools use a buddy system in which new personnel are paired with experienced personnel for dealing with ongoing problems as they arise. One of the complaints registered by many part-timers is the inadequacy of orientation programs. There is very little or no orientation for them outside of an initial conference with supervisory personnel.

Orientation may take place on an individual basis or in groups, and is often set up along subject matter lines. The most frequent method used is presentation followed by discussion, with the content usually including school policy and procedural matters, such as dealing with emergency situations, ordering supplies, and keeping records. Sometimes attention is given to the mission or philosophy of the particular school. In overview, orientation programs for vocational-technical personnel are not unlike those offered by school districts and community colleges for their entire teaching staff.

An unusual situation, in terms of orientation and inservice personnel needs, has been caused by the opening of several complete new area vocational centers, usually in September of each year. This will continue to occur

annually. Entire faculties, averaging twenty-five professionals, must be oriented for beginning classes in a few days' or weeks' time, which is but a prelude to ongoing inservice needs. It is not always possible to separate orientation programs from ongoing, long-range inservice activities aimed at program improvement and professional development.

New area centers in Oakland Intermediate School District have opened with up to three weeks of orientation, planning, and inservice training conducted by area center administrators, intermediate school district consultants, and some external personnel. A three-week orientation, planning, and inservice training program for the first Kent Skill Center at Grand Rapids was jointly planned and conducted by the intermediate school district staff, center administrative personnel, and three state universities (WMU, U of M, and MSU) prior to the opening of classes in 1971. A clear-cut need exists for continuation of this relationship over the entire year, in order to follow through with ongoing inservice personnel development objectives. It is expected that more of these joint operations will be encouraged in the future.

Inservice Schemes

Employer interviews disclosed information about the nature of inservice activities at secondary and post-secondary levels. It was stressed that inservice activities should ideally grow out of persistent problems as they arise, but that this is seldom the base for most inservice activities, since the usual menu consists of prestructured topics centering on school operation, curriculum improvement, and professional development as identified by administrators, consultants, teacher educators, etc. Inservice activities usually take the following forms: faculty meetings, inservice days, concentrated workshops, university credit courses and workshops, forums, organized experiences in local business and industry on short- and long-term basis, work with craft advisory committees, training courses offered by business and industry for teachers, and individual, independent study or work experience.

Formalized inservice professional development programs in schools are usually conducted by school administrators, intermediate school district consultants, State Office consultants, professional organization representatives, teacher educators, and individuals from the local community. Other agencies and organizations

which are involved to a lesser extent include private consultants, proprietory occupational school personnel, and trainers from local business and industry.

Financing for these operations is usually provided by the local school district, with occasional assistance from federal, state, and private resources. Much interest was expressed in conducting inservice professional development on a performance contracting basis, whereby accountability is provided.

A focal point for inservice efforts is indicated by administrators to be the not fully qualified teacher who lacks teacher education instruction, is weak in work experience, or is in need of more course work in his specialty. Also of special concern is the part-time teacher from the community, who needs help in organizing and presenting instruction.

Incentives

Numerous incentives have been developed for encouraging vocational education personnel to proceed with continuing or furthering their education. Most have left far behind the traditional viewpoint that incentives should not be necessary, that personal pride in achievement should be all that is necessary for professionals to proceed with their own professional development activities.

The most commonly used incentive is the payment of salary increases geared to completion of university credits. Some schools provide immediate rewards after every few additional credits are completed, while others recognize advancement only at the time of completing additional degrees. Another common incentive is the use of released time to attend inservice workshops, local craft advisory committee meetings, and the like during regular working hours. Most schools are able to pay some portion of expenses encumbered in attending professional meetings and short workshops, and a very few even pay tuition and living expenses. Extra wages often are paid for extended service during the summer break. Sabbatical leaves and faculty study grants and loans are gradually becoming more available. One of the more promising incentive plans appears to be the twelve-month contract, as is available at Lansing Community College, wherein professional development activities, such as work experience in industry or attending short courses sponsored by business and industry, may be included as a legitimate portion of the twelve-month contract.

Vocational-technical teachers appear to be at a disadvantage when it comes to rewards for participating in certain types of professional development activities which improve teacher competencies but do not carry university credit. Most schools seem to be locked into a system which can be opened only with the university credit hour key. The value of returning to business or industry for additional work experience cannot be debated. Yet it is often extremely difficult or impossible for teachers who choose this route to gain the same incentive payments as are awarded to others for whom formal university credit is the logical avenue for professional development. This inequality is often a bitter bone of contention in many local teacher organizations as they proceed with contract negotiations.

Other Institutions and Agencies Involved in Personnel Development

Obviously teacher education institutions aren't the only pebbles on the beach when it comes to personnel development. Other viable entities exist, which have been utilized for both preservice and inservice education. The major contribution of these agencies has been in improving occupational competencies rather than training in organizing, presenting, and evaluating instruction, although increasing opportunities exist here, too.

Private business and industry offer a variety of training programs for their own employees. Frequently these are open to professional educators at reasonable rates. Many are the resources of this type which can be tapped. Proprietory occupational schools offer another source for improving technical competencies; correspondence schools are included in this category. Large corporations which have expanded their operations and diversified into the field of education and training are also included, for they frequently offer courses in management for administrators and courses in preparation, presentation, and evaluation of instruction. Arrangements can be made individually and collectively on a contract basis for enrolling in these training programs.

Local business and industry can provide excellent opportunities for work experience. Private consultants with expertise in particular specialties can be engaged to service specific needs. Government agencies (local, state, and national) operate training programs of value to occupational education personnel, and the primary

contribution of all of these agencies is in improving occupational competencies rather than in organizing, presenting, and evaluating instruction, although considerable opportunities of this sort are available also.

Resources for Personnel Development

Resources for personnel development are supplied from local, state, and federal budgets in addition to unknown amounts that individuals spend privately toward self-improvement schemes. Specific sources of federal dollars for personnel development in 1971/72 are Part B, Regular Vocational Education Programs $212,500; Part F, Consumer and Homemaking Education Programs $58,750; and Part G, Cooperative Vocational Education Programs $22,000. An additional $100,000 is included within the $212,500 in Part B funds by the State Office for use with personnel development needs associated with high priority thrusts. All of these amounts are in addition to the regular $112,500 in state funds marked for use of vocational-technical teacher education institutions. Certain other funds, particularly research and Special Needs have possible application to personnel development requirements.

Monies were available to some states in 1970/71 through the Education Professions Development Act, Part F, Sections 552 and 553, but Michigan did not receive any funds from this source, although a small amount was authorized for a State Office proposal which was not utilized. Funds from EPDA Part F will be available to Michigan in increased amounts during 1971/72.

Vocational Teacher Certification Code

A new vocational teacher certification code has been prepared and awaits approval by the State Board of Education. It represents a significant step forward, since it consolidates and regularizes certification procedures which have varied widely among the vocational service areas, and it unifies the entire state teacher certification operation under one code and one office. Vocational teacher certification practices had become so diverse that professionals and laymen alike found them difficult to justify and to understand.

The new code provides for three basic types of vocational certification. They are (1) Secondary Provisional Certification with Vocational Endorsement followed by Continuing Certification with Vocational Endorsement, (2) Temporary Vocational Authorization followed by Full Vocational Authorization, and (3) Annual Authorization. Another section of the code provides for deviations from these forms with provision for "experimental" plans.

The Secondary Provisional and Continuing certifications with Vocational Endorsement are the standards for full vocational certification. Their provisions include completion of a vocational teacher education program with a Bachelor's degree, a major or a minor, and two years of work experience. Continuing Certification requires three years of successful teaching experience plus an additional eighteen semester hours credits. Persons completing these requirements will be qualified to teach both general and vocational education courses in their subjects.

The Vocational Authorization category is provided so that individuals with Bachelor's degrees, work experience, and appropriate majors or minors, but without teacher education qualifications, may be employed on the recommendation of designated vocational teacher education institutions. It is assumed that these people will be enrolled as inservice teachers to correct their deficiencies.

Annual Authorization is provided for the candidate who does not meet the standards outlined for Temporary Vocational Authorization nor for Vocational Endorsement. This option allows employment of nondegree, nonteacher-education background personnel who possess appropriate work experience and interest in teaching. This category serves a buffer function, allowing school employers to engage such persons when fully qualified personnel cannot be secured. The way the new code is written, however, it is entirely possible to employ and continue the employment of this kind of person from year to year despite the availability of fully qualified degree personnel. This person cannot be "bumped."

Provision is made for further professional development by requiring the completion of additional course work in vocational education. The Continuing Certification category allows the course work to be in both the occupational specialization and in professional vocational education, while Full Vocational Authorization specifies that it be in professional vocational education. Unfortunately the new code does not require the Annual

Authorization holder to accomplish any inservice professional development work in order to continue on from year to year. This is particularly unfortunate because these teachers are probably the most in need of upgrading.

The work experience requirement for all occupational fields has been reduced to a minimum of two years, and is to be characterized by its recency and relevancy. In lieu of the two years of work experience, a planned equivalent program of directed supervised occupational experience approved by the Department of Education may be substituted. This refers to internships, cooperative work experiences, and the use of competency examinations. Some interesting practices have developed with regard to supervised work experience for which university credit is given. It appears business teacher educators have agreed that university-supervised cooperative work experience may be substituted for at least part of the two-year work experience requirement. The unusual feature of this agreement is that one month of supervised cooperative work experience is rated as equivalent to six months when applied toward the two-year requirement. This compressed supervised work experience plan is certainly better than work experience with no supervision, but it is difficult to understand that it can be six times as good. It was found, however, that not all business teacher education departments buy this concept.

Competency examinations are being used by some technical and trade teacher education departments on a cooperative basis, using the services of a faculty member at Eastern Michigan University to develop, refine, administer, and evaluate these examinations. At least one institution provides its own competency examination service.

An important feature continued in the new code is that teacher education institutions will recommend candidates to the State Board of Education for certification. Apparently this will apply to all but the Annual Authorization, which will be handled by the Department of Education.

A major or minor in the occupational area of endorsement is required in the new code, as it was in the old. Problems will arise when endorsing individuals for highly specialized areas where only a course or two, let alone a full minor, exist in colleges and universities; for example, carpentry and auto body repair.

All community college and adult education approvals will be dropped in 1971/72. The only community college or adult instructors required to hold a certificate will be those teaching high school completion courses. Certification for cooperative coordinators is also being eliminated this year.

Summary

The existing stocks of personnel in secondary, post-secondary, and adult education programs; university teacher education programs; and the State Vocational Education and Career Development Services have been identified and summarized, thus producing a necessary quantitative base for use in projecting future requirements for new teachers.

Next, potential sources of teacher supply were examined, which included (1) teacher education graduates who postpone entry; (2) former teachers; (3) qualified teachers from nonteaching positions in education; (4) qualified teachers who have been in higher education, overseas, and private schools; (5) individuals with degrees but without complete teacher education qualifications; (6) individuals without degrees or teacher education from business, industry, and military; and (7) graduates currently completing teacher education programs. Future outputs particularly from the latter category, were quantified to indicate the future supply. These supply data will be compared with demand requirements in Section IV to determine points of undersupply and oversupply.

In the final portion of this section the existing system for personnel development was reviewed in some detail, bringing attention to several important features.

SECTION IV

DEMAND FOR PERSONNEL

Recent and prospective trends in the development of occupational education in Michigan were discussed in Section II, and concluded with projected enrollments at the various levels of occupational education. The many variables which affect the development of occupational education were reviewed, which led to the formation of high- and low-range enrollment projections. Personnel sources and supplies were presented in Section III. In Section IV the qualitative and quantitative demand for personnel will be reviewed and organized by employer types, occupational service areas, and types of personnel. This analysis will result in projections of personnel needs for five years, 1971/72 through 1975/76.

Review of Former and Existing Personnel Need Projections

National Projections

The most comprehensive and best known recent national study of personnel needs in vocational-technical education was prepared by Kauffman for the United States Office of Education, and published in September, 1970 (27:51-64). The study relied upon existing data possessed at the federal level, and did not seek new information. In his presentation Kauffman reviewed the demand for vocational education personnel through 1975, and projected the need for a total of 448,300 teachers (Table 61). When supply was compared with demand, the resulting requirement was 21,800 new secondary, 12,000 new post-secondary, and 9,900 new adult teachers in 1975 (Table 62). Numbers of ancillary personnel needed during 1975 were projected, as appear in Table 63. For a summarization of Kauffman's projections, see Davies' article in the American Vocational Journal, November, 1970 (7).

TABLE 61.--ENROLLMENTS AND TEACHERS PROJECTED TO 1975 BY LEVEL AND TYPE OF PROGRAM: PUBLIC AND PRIVATE VOCATIONAL EDUCATIONAL

Level and Type of Program	Enrollments	Teachers[a]
All Programs	19,170,000	448,300
Secondary	9,300,000	173,300
Postsecondary	2,620,000	113,900
Adult	7,250,000	161,100
Trades and Industry	4,474,000	148,300
Secondary	1,206,000	37,900
Postsecondary	644,000	30,900
Adult	2,624,000	79,500
Office	4,973,000	104,700
Secondary	3,050,000	58,600
Postsecondary	974,000	28,600
Adult	949,000	17,500
Distributive	1,469,000	27,900
Secondary	372,000	7,000
Postsecondary	89,000	2,600
Adult	1,008,000	18,300
Health	297,000	19,200
Secondary	37,000	1,600
Postsecondary	246,000	17,000
Adult	14,000	600
Home Economics	5,817,000	81,900
Secondary	4,005,000	56,900
Postsecondary	13,000	300
Adult	1,799,000	24,700
Technical	1,245,000	54,400
Secondary	130,000	4,500
Postsecondary	649,000	34,400
Adult	466,000	15,500
Agriculture	896,000	11,900
Secondary	500,000	6,800
Postsecondary	6,000	100
Adult	390,000	5,000

[a]These projections are based on previously published data.

Source: (27).

TABLE 62.--NEED FOR VOCATIONAL EDUCATION TEACHERS IN 1975

Level	Replacement Need (1)	Teachers Reentering (2)	(1-2)	Expansion Needs	Total New Needs
Secondary	14,900	5,200	9,700	12,100	21,800
Postsecondary	4,000		4,000	8,000	12,000
Adult	6,600	2,300	4,300	5,600	9,900

Source: (27)

TABLE 63.--ACTUAL AND PROJECTED NUMBERS OF ANCILLARY PERSONNEL 1966 and 1975

Personnel--State Level	1966	1975
Directors or supervisors	378	860
Asst. directors or supervisors	420	1,080
Area supervisors	257	1,230
Youth specialists	32	240
Teacher trainers	160	150
Itinerant teachers	182	400
Research specialists	59	150
Guidance specialists	46	150
Curriculum specialists	79	150
Other	125	320
Teacher trainers (institutions)		
Local Level	2,145	5,666
Directors or supervisors	3,080	9,420
Guidance specialists	1,009	1,980
Curriculum specialists	123	320
Other	317	740
TOTAL		22,856

Source: (27)

The National Education Association provided demand projections for secondary-level vocational and practical or applied arts education personnel (Table 64). The projection included agriculture, business, distributive, home economics, industrial arts, trade and industrial education, but did not distinguish reimbursed vocational education from practical or applied arts personnel, nor did it cover post-secondary personnel needs.

TABLE 64.--SUMMARY OF TWO ADJUSTED TREND CRITERION ESTIMATES OF THE DEMAND FOR NEW TEACHERS IN 1970-71[a]

Assignment	Projected total 1970-71 demand distributed as reported by 23 states in 1969-70	Projection of total demand based on the relation of new staff to total staff in assignment in 1969-70 on basis of estimated total staff distribution from national sampling studies
Agriculture	1,053	1,083
Business education	5,792	8,204
Distributive education	316	--
Home economics	3,896	6,590
Industrial arts	3,896	6,146
Trade, industrial, vocational	1,790	1,808

[a]Condensed from original.

Source: (43).

Although dated March, 1968, projections on personnel needs prepared for the Subcommittee on Education of the United States Senate are worthy of notice (Tables 65 and 66). They were prepared to determine the amount of federal funds needed to serve vocational education adequately.

The Manpower Report of the President, dated March, 1970, contained pertinent observations on national trends for a ten-year period through 1978 (49). It reported that as of 1969, vocational education and industrial arts shortages were significant, but that the overall situation

TABLE 65.--ACTUAL AND PROJECTED NUMBER OF TEACHERS FOR VOCATIONAL AND TECHNICAL EDUCATION PROGRAMS

Fiscal Year	Number of Teachers
Actual	
1964	85,102
1965	109,136
1966	124,729
Projected	
1967	146,383
1968	163,150
1970	213,300
1975	350,000

Source: (74)

would be one of sudden improvement in easing the general teacher shortage. This change was explained as resulting from the significant increase in the number of new college graduates at the end of the 1960's, due to the post-World War II upsurge in births, while concurrently the new teacher demand, which had climbed persistently throughout the postwar period, would turn downward, due to a substantial reduction in the school-age population growth rate. The Report further stated that

> during the 1970's school enrollments will level off even more. . . . Secondary school enrollments will continue to rise but much less rapidly than in recent years, probably only about 14% over the 1968-1980 period, or only about one-fifth as fast as during the preceding twelve years.

Despite increasing needs for replacement of teachers who retire, die, or leave the profession, this will not nearly offset the larger numbers of college graduates in this decade. The resulting situation, it was reported, will be one of relatively limited demand. The Report further indicated that "the number of new college graduates . . . seeking secondary school positions could be nearly 75% above requirements." Teachers are the disadvantaged and handicapped are expected to continue in short supply in the 1970's. The availability

TABLE 66.--ACTUAL AND PROJECTED STATE AND LOCAL ADMINISTRATIVE AND OTHER ANCILLARY PERSONNEL IN VOCATIONAL EDUCATION

	Fiscal Year						
	1965*	1966*	1967	1968	1969	1970	1975
State Level							
Directors or supervisors	336	360	372	385	405	425	530
Assistant directors or supervisors	370	414	420	430	450	470	650
Area supervisors	303	298	340	380	420	460	740
Youth specialists	38	28	50	75	80	90	145
Teacher trainers	52	56	58	60	65	68	90
Itinerant teachers	141	177	185	190	200	210	235
Research specialists	19	58	62	65	68	70	90
Guidance specialists	36	51	65	70	75	85	95
Curriculum specialists	37	52	54	60	65	70	90
Work-study	31	28	25	--	--	--	--
Other	111	135	135	135	140	150	200
Subtotal	1,474	1,657	1,766	1,850	1,968	2,098	2,865
Institutions: Teacher trainers	1,571	2,145	2,359	2,480	2,560	2,640	3,150
TOTAL, State	3,045	3,802	4,125	4,330	4,528	4,738	6,015
Local Level							
Directors or supervisors	2,729	2,936	3,106	3,275	3,600	3,950	5,675
Guidance specialists	874	962	985	1,000	1,025	1,050	1,200
Curriculum specialists	162	123	135	142	150	160	200
Work-study	72	607	450	--	--	--	--
Other	271	313	310	310	330	350	450
TOTAL, Local	4,108	4,941	4,986	4,727	5,105	5,510	7,525
TOTAL, State and Local	7,153	8,743	9,111	9,057	9,633	10,248	13,540

*Actual--all other years projected

Source: (74)

of teachers for accommodating enlarged vocational education offerings may be increased, due to the filling of other fields, which may cause individuals to prepare for teaching in shortage fields.

Regarding college and university personnel, the Report indicated that the supply of new graduates with advanced degrees would be available in record numbers during a decade when the growth in college positions is likely to be only about one-third of that of the 1960's.

Michigan Projections

Only two projections of Michigan vocational-technical education personnel needs were located, but neither compared demand with supply to determine gaps. A study entitled "A Survey of Anticipated Needs for Vocational-Technical Education Teachers in Michigan" by the Division of Vocational Education, April, 1965, included returns from 320 K-12 school districts and thirteen community colleges (Appendix 12). It presented gross numbers of additional personnel needed for new programs or expansion, but apparently did not include numbers needed for replacements.

The State Plan for Vocational Education, 1971/72 (61) projected numbers of teachers needed by year through 1976 for various types of programs (Table 67). These projections amount to average annual increases of 4.7% for secondary teachers, 4.4% for post-secondary teachers, and 7.6% for adult program teachers.

Methods for Projecting Demand

During the past two or three decades, important strides have been made in developing methods for projecting personnel requirements. Herbert Parnes categorized these methods into the manpower approach and the cultural approach (44). The latter recognizes the need for education to serve more than economic purposes, and is defined as follows:

TABLE 67.--NUMBER OF TEACHERS IN VOCATIONAL EDUCATION PROGRAMS

Vocational Programs	Level of Program														
	1972			1973			1974			1975			1976		
	S*	PS	A	S*	PS	A	S*	PS	A	S*	PS	A	S*	PS	A
Total Number of Teachers (Unduplicated)	3240	2020	2076	3394	2111	2138	3547	2210	2189	3703	2325	2249	3900	2400	2300
Special Programs: Exemplary	10	2	0	15	4	2	15	4	2	15	6	4	15	6	4
Group Guidance (Prevocational)	30			45			55			70			75		
Pre- Post-secondary															
Remedial (Basic Education)															
Cooperative, Part G	63	5	0	88	10	0	115	15	0	138	20	0	165	25	0
Disadvantaged	250	50	35	300	60	50	390	70	60	425	75	65	500	85	75
Handicapped	55	10	5	60	20	8	65	25	10	70	30	15	75	35	20
Other 1/															
Occupational Programs: (Specify by OE Code)															
01.	215	36	75	215	38	85	225	43	95	230	49	110	250	55	125
04.	470	107	370	505	110	385	530	115	395	550	120	405	575	125	420
07.	47	381	25	53	418	28	58	459	30	63	505	33	70	525	40
09.01	875		310	900		315	925		320	950	10	325	1000	15	330
09.02	135	15	5	140	20	10	145	20	10	150	25	15	155	25	15
14.	970	335	230	1010	350	245	1050	370	260	1100	390	275	1150	400	280
16.		397	76		417	80		438	84		459	88		475	90
17.	528	751	985	571	758	990	614	765	995	660	772	998	700	780	1000
Other (Specify)													(50)		

S - Secondary; PS - Post-secondary; A - Adult
* - Include in ( ) number of elementary teachers.
1/ - Other types of vocational education personnel, such as aides and other personnel involved in the conduct of State Plan Programs.
Source: (61)

> This view, from the vantage point of the individual, stresses the consumption aspects of education and, from the vantage point of society, stresses education as an "investment" to which returns cannot be calculated in money terms--an investment in values that are either indispensable or highly desirable to the society, i.e., an informed citizenry, equality of opportunity, etc. (44:63).

On the other hand, the manpower approach is based on socio-economic needs, and develops the personnel and education requirements necessary to achieve specific economic goals. Parnes stated that in the manpower approach "one postulates a given rate in character of economic growth and asks what investment in education is necessary to achieve that growth objective."

Within the manpower approach are three general approaches which have been used at various times and places throughout the world, according to Goldstein and Swerdloff (37:11). These are (1) employers' forecasts, (2) extrapolation based on historical trends, and (3) analytical or econometric methods. The first method constitutes surveying employers to determine their judgments as to future hirings covering the years and types of personnel under study. These results are likely to be more accurate in short range than in longer time spans. The second method projects quantitative trend lines into the future, based upon past performance. Unless such extrapolations are flavored with other known factors, the results are likely to be far from desirable. The third method embodies a careful analysis of factors affecting demand, consideration of how these factors may operate in the future, development of equations or models, and their application to projection problems. This method runs into difficulty because of problems in providing for the numerous known and unknown variables. In this study reliance is placed primarily upon the employer survey and extrapolation methods, but not to the total exclusion of concern for the cultural approach.

It should be abundantly clear that personnel or manpower forecasting is more an art than it is a science; it must rely heavily upon human judgment. Social and economic events may swiftly and drastically alter the best of projections. Their fallibility may be further hampered by funding and other policy changes at federal and state levels. Furthermore, possessing insufficient data often makes it difficult or impossible to allow for various known influencing factors. The net effect is the probability that projections are in error to some extent, and that errors are likely to be greater the further they extend into the future.

Personnel Requirements--Quantitative

Teacher and Cooperative Coordinator Requirements

School Employer Interviews

This study has emphasized the importance of interviewing Michigan's vocational-technical education program administrators to determine directly their views on quantitative and qualitative aspects of future personnel needs. At times it seemed as if the time and energy spent upon this aspect of the study were somewhat excessive. In retrospect, this emphasis was well worth the expenditure, since the data, comments, and insights thus gained were far more clear and complete than the usual paper and pencil questionnaire exchanged through the mail. Deans of occupational education at all public community colleges were interviewed in person at their institutions. All secondary area vocational center head administrators, including those in the earlier stages of development, were interviewed, as were intermediate school district consultants and implementors. Limitations of time made it impossible to visit each of the K-12 school district vocational directors in person. Instead, telephone interviews were substituted. The results of these interviews are regarded as especially valuable for the immediate future; that is, 1971/72 and 1972/73. It was very difficult for program administrators to project beyond two years, since sources and amounts of future funding are very uncertain. In addition, it was possible to obtain in each interview a record of the numbers of persons hired the previous year. Tables summarizing the quantitative findings by occupational area, employer types, professional types, occupational field, and by year follow. These findings are limited to requirements for additional personnel only, not replacements nor total volume to be employed.

Secondary Teacher Requirements According to Employer Interviews

Directors of secondary vocational-technical programs and area vocational centers were interviewed to determine the nature of hirings for the current year (1970/71) and their future staffing expectations through 1975/76. Table 68 shows the results of telephone interviews with fifty-four local school district

TABLE 68.--SECONDARY PERSONNEL DEMAND ACCORDING TO FIFTY-FOUR LOCAL SCHOOL DISTRICT VOCATIONAL DIRECTORS, 1970/71-1975/76

Personnel Types	70/71		71/72		72/73		73/74		74/75		75/76		72-75[d]		TOTAL	
Teachers/Coop Coordinator	a	b	c	b												
01 Agriculture							Insufficient Data									
03 Business[e]	17	26	14	22	--	--	2	3	2	3	--	--	1	2	36	56
04 Distributive	5	8	1	2	3	5	3	5	--	--	--	--	4	6	16	26
07 Health	1	2	3	5	5	9	1	2	1	2	--	--	--	--	11	20
09 Home Ec	28	70	10	25	6	15	5	13	2	5	2	5	6	15	59	148
14 Office	1	2	2	3	4	6	4	6	--	--	--	--	3	5	14	22
17 Trade & Industry	28	60	36	77	21	45	13	28	1	2	6	13	13	28	118	253
Teachers-Special Needs	16	36	6	14	--	--	--	--	--	--	--	--	1	2	23	52
Teachers-Miscellaneous	--	--	--	--	4	9	--	--	--	--	--	--	6	14	10	23
Coop Coordinators[f]	16	36	14	32	9	20	5	11	--	--	--	--	6	14	50	113
SUB TOTAL	112	240	86	180	52	109	33	68	6	12	8	18	40	86	337	713
Admin./Supervisors	3	--	4	--	--	--	1	--	--	--	1	--	--	--	9	--
Consultants/Specialists	--	--	2	--	--	--	--	--	3	--	--	--	--	--	5	--
Guidance/Placement	2	--	10	--	1	--	--	--	--	--	--	--	4	--	17	--
Paraprofessionals	--	--	3	--	1	--	--	--	--	--	--	--	--	--	4	--
SUB TOTAL	5	--	19	--	2	--	1	--	3	--	1	--	4	--	35	--
TOTAL	117	240	105	180	54	109	34	68	9	12	9	18	44	86	372	713

[a]Record of actual hirings by fifty-four districts.

[b]Number of hirings adjusted to compensate for approximately 400 other secondary districts not contacted.

[c]Number of additional personnel expected to be hired by fifty-four districts.

[d]Some respondents preferred to specify their staff needs after 1971/72 in a four year block.

[e]Category used to designate Business hirings with specialization undefined. Classification listed in Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI, United States Office of Education, OE-23052, 1970.

[f]A few coop coordinators may be within some of the above numbers.

vocational directors. The left-hand column for each year shows the actual number of additional persons to be engaged. The right-hand column contains adjusted teacher personnel needs. The latter was calculated in an attempt to compensate for the approximately 400 other local secondary school districts which had no reimbursed vocational director to be contacted. An adjustment factor or percentage was determined for each occupational field by dividing the total number of Michigan teachers in that field by the number included in the survey group. These results were assumed to be reasonably useful estimates of future personnel needs of local secondary school districts.

Estimates of additional secondary personnel needs by secondary area vocational center administrators appear in Table 69. Their estimates for 1973/74 onward are low, and reflect many uncertainties. If improved ways of funding these area centers are developed soon, several more will be built and staffed during the period 1973/74 onward, thus increasing significantly the numbers recorded in this table.

When the personnel demands of local districts (Table 68) and of area vocational centers (Table 69) are combined, a composite secondary vocational personnel additional requirement profile is produced (Table 70). The demand for vocational agriculture teachers could not be appraised with the above methods, and was therefore eliminated from Table 70. The fact that the secondary local district survey included only those districts with reimbursed vocational directors placed an emphasis upon urban school districts, thus tending to exclude agricultural programs. Furthermore, the area vocational center survey also tended to emphasize urban occupational programs, and thus did not provide a proper appraisal of vocational agriculture professional personnel needs.

One way to provide an estimate of vocational agriculture teacher demand is by averaging the in-state placement of new graduates for the past five years, using data furnished by the NEA Survey. This results in an average of twenty per year. During the same period an average of ten were listed as "No Information," which would indicate that a few more, perhaps two to four, may have taken in-state vocational agriculture teaching positions annually. Thus an average annual demand of about twenty-three teachers can be projected if it is assumed that vocational agriculture programs in Michigan

TABLE 69.--SECONDARY AREA VOCATIONAL CENTER PERSONNEL DEMAND ACCORDING TO TWENTY-TWO HEAD ADMINISTRATIVE OFFICERS, 1970/71-1975/76

Personnel Types	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL
Teachers/Coop Coordinators								
01 Agriculture	3	7	5	1	1	--	--	17
04 Distributive	6	4	9	1	--	--	--	20
07 Health	11	13	9	1	--	--	1	35
09 Home Ec	12	13	12	1	--	--	4	42
14 Office	8	2	20	1	--	--	--	31
17 Trade & Industry	50	71	67	10	--	--	9	207
Teachers-Special Needs	--	--	1	--	--	--	--	1
Coop Coordinators	2	--	1	1	--	--	--	4
SUB TOTAL	92	110	124	16	1	--	14	357
Administrators/Supervisors	10	--	--	--	--	--	--	10
Consultants/Specialists	3	1	1	1	--	--	--	6
Guidance/Placement	2	10	1	--	--	--	4	17
Paraprofessionals	15	4	11	--	--	--	--	30
SUB TOTAL	30	15	13	1	--	--	4	63
TOTAL	122	125	137	17	1	0	18	420

[a]Record of actual hirings.

[b]Some respondents preferred to specify their staff needs after 1971/72 in a four year block.

TABLE 70.--SECONDARY PERSONNEL DEMAND, COMPOSITE OF LOCAL SCHOOL DISTRICT AND AREA VOCATIONAL CENTER EMPLOYER INTERVIEWS, 1970/71-1975/76

Personnel Types	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL
Teachers/Coop Coordinators								
01 Agriculture	Insufficient Data							
03 Business[c]	26	22	--	3	3	--	2	56
04 Distributive	14	6	14	6	--	--	6	46
07 Health	13	18	18	3	2	--	1	55
09 Home Ec	81	38	27	14	5	5	19	189
14 Office	10	5	26	7	--	--	5	53
17 Trade & Industry	111	148	112	38	2	13	37	461
Teachers-Special Needs	39	14	1	--	--	--	2	56
Teachers-Miscellaneous	--	--	9	--	--	--	14	23
Coop Coordinators	38	32	21	12	--	--	14	117
SUB TOTAL	332	283	228	83	12	18	100	1056
Administrators/Supervisors	13	4	--	1	--	1	--	19
Consultants/Specialists	3	3	1	1	3	--	--	11
Guidance/Placement	4	20	2	--	--	--	8	34
Paraprofessionals	15	7	12	--	--	--	--	34
SUB TOTAL	35	34	15	2	3	1	8	98
TOTAL	367	317	243	85	15	19	108	1154

[a] Includes actual area vocational center hirings plus projected local school district hirings.

[b] Some respondents preferred to specify their staff needs after 1971/72 in a four year block.

[c] Category used to designate Business hirings with specialization undefined. Classification listed in Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI, United States Office of Education, OE-23052, 1970.

schools will not decline or expand appreciably in the period covered by this study. It should be noted that although the record of vocational agriculture enrollments for the past five years shows a small decline, Annual and Long-Range Program Plans from secondary level units indicate significant expansion for the next five years (Table 17).

Post-Secondary Teacher Requirements According to Employer Interviews

Estimates of personnel needs by community college occupational education deans may be regarded as reasonably firm, since at the time of interview most deans had recently completed long-range program plans as requested by the State Board of Education, and were therefore "primed" for questions on personnel needs (Table 71). Despite this, it was difficult for many occupational deans to specify requirements beyond 1972/73. Hence some preferred to list the needs as sometime between 1972/73 and 1975/76. If these latter totals are divided by four and spread out over the four years, the drop-off after 1971/72, as shown in Table 71, would be much smaller.

Since the rapid buildup of community college personnel during the 1960's, there has been a leveling off, or plateauing tendency, in full-time personnel hirings. Some deans indicated their staffing plans now center upon developing a few key nucleus, versatile, full-time personnel in each occupational program and then supplementing them with a variety of capable part-time teachers available on call. This may account, in part, for the apparent tapering off of anticipated full-time personnel hirings indicated in Table 71. It should be pointed out that data listed for 1970/71 are a record of actual hirings of additional full-time personnel, not anticipated needs.

It is significant to note that approximately 75% of the additional personnel requirement is in trade, technical, and health occupations. Requirements in business-related occupations are indicated to be considerably less. Since these faculties are fairly well established, considerable reliance is being placed upon local business persons willing to serve as part-time teachers.

TABLE 71.--POST-SECONDARY PERSONNEL DEMAND ACCORDING TO TWENTY-NINE COMMUNITY COLLEGE OCCUPATIONAL EDUCATION DEANS, 1970/71-1975/76

Personnel Types	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL
Teachers/Coop Coordinators								
01 Agriculture	1	3	1	1	--	--	--	6
03 Business[c]	2	--	2	2	2	2	12	22
04 Distributive	1	6	1	1	2	--	4	15
07 Health	20	41	5	1	3	1	43	114
09 Home Ec	--	1	2	--	2	--	3	8
14 Office	9	8	1	--	2	--	11	31
16 & 17 Tech & Trade	20	32	25	9	7	2	48	143
Coop Coordinators	--	--	--	--	--	--	1	1
SUB TOTAL	53	91	37	14	18	5	122	340
Administrators/Supervisors	2	3	--	--	--	--	--	5
Consultants/Specialists	--	1	--	--	--	--	--	1
Guidance/Placement	--	1	--	1	1	--	--	3
Paraprofessionals	1	4	--	--	4	--	16	25
SUB TOTAL	3	9	--	1	5	--	16	34
TOTAL	56	100	37	15	23	5	138	374

[a]Record of actual hirings.

[b]Some deans preferred to specify their staff needs after 1971/72 in a four year block.

[c]Category used to designate Business hirings with specialization undefined. Classification listed in Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI, United States Office of Education, OE-23052, 1970.

It should be noted that some community colleges expected staffing reductions in 1971/72 totaling eight full-time teaching positions. However, these reductions were due, in each instance, to special local circumstances.

Student Enrollment
Projection Base

Student enrollment projections through 1975/76 were developed and presented in Section II. Total enrollments of all programs were made first, with the total then disaggregated by secondary, post-secondary, and adult programs. Each of these was further separated into enrollments by occupational codes. A range of probable enrollments was made in each case, rather than a single line projection. Thus a high and a low number of enrollments for each year were projected. Student enrollment projections were based upon past rates of growth, with attention to the several factors affecting the development of vocational-technical education.

To project total numbers of teachers needed, it was necessary to establish teacher/student ratios for each vocational-technical program and occupational field therein. Existing teacher/student ratios were selected as being the most appropriate point of departure for future years. Therefore, 1969/70 data were used, resulting in a wide variation in teacher/student ratios. These range from 1:22 for post-secondary programs through 1:43 in adult programs to 1:60 for secondary programs. The overall teacher/student ratio for all vocational-technical education is 1:45. Part-time and full-time teachers are combined, assuming that approximately the same mixes would prevail in the years covered by this report. The above teacher/student ratios are then applied to the secondary, post-secondary, and adult enrollment projections as listed in Section II, resulting in quantitative teacher demand projections as shown in Table 72. It should be noted that these projections are inclusive of all teachers to be employed at a given time, not limited to expansion needs alone, as was true with the employer interview estimates.

Next, the requisite demands for personnel are disaggregated by personnel categories and occupational fields, since these added details are necessary to define adequately future personnel demands.

TABLE 72.--PROJECTED TOTAL TEACHER REQUIREMENTS BY PROGRAM, 1969/70-1975/76[a]

Year	Secondary		Post-Secondary		Adult		Composite	
	Low	High	Low	High	Low	High	Low	High
1969/70[b]	2,823		1,601		2,824		7,248	
1970/71	3,030	3,115	1,750	1,853	3,012	3,069	7,774	7,992
1971/72	3,242	3,426	1,925	2,159	3,196	3,314	8,318	8,791
1972/73	3,469	3,769	2,117	2,515	3,391	3,574	8,900	9,670
1973/74	3,717	4,146	2,329	2,930	3,596	3,848	9,523	10,637
1974/75	3,972	4,561	2,562	3,414	3,811	4,135	10,190	11,701
1975/76	4,250	5,017	2,818	3,977	4,039	4,435	10,903	12,871

[a]Teacher/student ratios used were based on 1969/70 data: Secondary 1:60, Post-Secondary 1:22, Adult 1:43.

[b]Actual recorded number.

Total Secondary Teacher Requirements by Projection

Secondary teacher personnel needs based on student enrollment projections and teacher/student ratios are presented here. Existing ratios, as in the second column of Table 73, are developed for each occupational area based on 1969/70 data, and they vary widely. These ratios are applied to the secondary enrollment projections developed in Section II, with the resulting quantitative teacher demand projections by occupational fields (Table 73). These appear as a range, rather than a specific number for each year and occupational field. They constitute total numbers of teachers to be engaged, inclusive of existing stocks, replacements, and additions.

Net Requirements for New Secondary Vocational Teachers

Estimates of total numbers of secondary teachers needed by occupational fields in the five years ahead are based on student enrollment projections and existing teacher/student ratios (Table 73). Next the requirement for new personnel is presented (Table 74). New personnel includes additions and replacements. The aggregate demand minus existing stocks yields the projected total new teacher requirements. Existing stocks for each successive year are reduced by a 5% attrition allowance before being assumed as the existing stocks for the following year. The 5% attrition rate is based on 1969/70 experience of secondary vocational administrators. The rate may be decreasing somewhat now, due to current economic conditions. The total new teacher requirement includes replacement and additional teacher requirements.

New graduates with initial certification are then compared with the total new teacher requirement, thus displaying either a surplus or deficit. New graduate numbers are reduced by 30%, since only about 70% seek employment as teachers, based on 1969/70 experience. The university initial certification outputs used in these projections are found in Table 47. It is assumed that these outputs have been prepared for secondary teaching, not for post-secondary teaching, administration, or ancillary services. It is recognized that some do go into post-secondary teaching immediately, but that this is the exception rather than the rule. Post-secondary institutions usually prefer to hire more experienced teachers.

TABLE 73.--PROJECTED TOTAL SECONDARY TEACHER REQUIREMENT RANGE, DISAGGREGATED BY OCCUPATIONAL CODE, 1971/72-1975/76

Occupational Code	1969/70 Teacher/Student Ratio[a]	1971/72		1972/73		1973/74		1974/75		1975/76	
		Low	High	Low	High	Low	High	Low	High	Low	High
01 Agric.	1:63	225	238	241	262	258	288	276	317	295	349
04 D.E.	1:62	301	318	322	350	345	385	369	424	395	466
07 Health	1:90	37	39	39	43	42	47	45	52	48	57
09 Home Ec	1:80	1109	1172	1186	1289	1269	1418	1358	1560	1453	1716
14 Office	1:50	891	942	953	1036	1020	1139	1091	1253	1168	1378
17 T&I	1:37	673	711	720	782	770	861	824	947	882	1041

[a]Overall secondary teacher/student ratio was 1:60 in 1969/70.

TABLE 74.--NET QUANTITATIVE REQUIREMENTS FOR NEW SECONDARY TEACHERS

Year		Aggregate Demand	Existing Stocks[a]	Total New Teacher Requirements[b]	New Grads With Initial Certification[c]	Gap[d]
SUMMARY - 40% Full-Timers[e]						
1971/72	Low	3242	2879	364	1081	+613 to +717
	High	3426	2959	468		
1972/73	Low	3469	3080	389	1205	+691 to +816
	High	3769	3255	514		
1973/74	Low	3717	3296	421	1259	+694 to +838
	High	4146	3581	565		
1974/75	Low	3972	3531	441	1367	+745 to +926
	High	4561	3939	622		
1975/76	Low	4250	3773	477	1441	+757 to +964
	High	5017	4333	684		
01 AGRICULTURE - 37% Full-Timers[e]						
1971/72	Low	225	200	25	17	- 8 to - 15
	High	238	206	32		
1972/73	Low	241	214	27	12	- 15 to - 24
	High	262	226	36		
1973/74	Low	258	229	29	8	- 21 to - 31
	High	288	249	39		
1974/75	Low	276	245	31	12	- 19 to - 31
	High	317	274	43		
1975/76	Low	295	262	33	15	- 18 to - 33
	High	349	301	48		
04 DISTRIBUTIVE - 43% Full-Timers[e]						
1971/72	Low	301	267	34	64	+ 21 to + 30
	High	318	275	43		
1972/73	Low	322	286	36	65	+ 17 to + 29
	High	350	302	48		
1973/74	Low	345	306	39	75	+ 23 to + 36
	High	385	333	52		
1974/75	Low	369	328	41	80	+ 22 to + 39
	High	424	366	58		
1975/76	Low	395	351	44	84	+ 21 to + 40
	High	466	403	63		
07 HEALTH - 69% Full-Timers[e]						
1971/72	Low	37	32	5	?	- 5 to - 6
	High	39	33	6		
1972/73	Low	39	35	4	?	- 4 to - 6
	High	43	37	6		
1973/74	Low	42	37	5	?	- 5 to - 6
	High	47	41	6		
1974/75	Low	45	40	5	?	- 5 to - 7
	High	52	45	7		
1975/76	Low	48	43	5	?	- 5 to - 8
	High	57	49	8		

TABLE 74.--Continued

Year		Aggregate Demand	Existing Stocks[a]	Total New Teacher Requirements[b]	New Grads With Initial Certification[c]	Gap[d]
09 HOME EC. - 39% Full-Timers[e]						
1971/72	Low	1109	984	125	279	- 6 to +154
	High	1172	1012	285		
1972/73	Low	1186	1053	133	309	0 to +176
	High	1289	1113	309		
1973/74	Low	1269	1127	142	319	+126 to +177
	High	1418	1225	193		
1974/75	Low	1358	1206	152	331	+118 to +179
	High	1560	1347	213		
1975/76	Low	1453	1290	163	344	+110 to +118
	High	1716	1482	234		
14 OFFICE - 39% Full-Timers[e]						
1971/72	Low	891	791	100	562	+433 to +462
	High	942	813	129		
1972/73	Low	953	846	107	639	+498 to +532
	High	1036	895	141		
1973/74	Low	1020	905	115	644	+489 to +529
	High	1139	984	115		
1974/75	Low	1091	969	122	689	+518 to +567
	High	1253	1082	171		
1975/76	Low	1168	1036	132	715	+527 to +583
	High	1378	1190	188		
17 TRADE AND INDUSTRIAL - 39% Full-Timers[e]						
1971/72	Low	673	598	75	159	+ 63 to + 84
	High	711	615	96		
1972/73	Low	720	639	81	180	+ 73 to + 99
	High	782	675	107		
1973/74	Low	770	684	86	214	+ 96 to +128
	High	861	743	118		
1974/75	Low	824	732	92	256	+127 to +164
	High	947	818	129		
1975/76	Low	882	783	99	283	+142 to +184
	High	1041	900	141		

[a]Stocks from previous year, less 5% for attrition.

[b]Aggregate demand minus existing stocks. Inclusive of additional positions and replacements, also full- and part-time.

[c]New grads with initial certification, less 30% not entering teaching.

[d]Difference between new grads and new teacher requirements. Plus (+) indicates oversupply, minus (-) indicates undersupply.

[e]Indicates the percentage of full-time personnel during 1969/70 which could be applied to the projections below to disaggregate full- and part-time teacher requirements.

When all secondary vocational fields are aggregated in the summary section of Table 74, the supply of beginning teachers with initial certification from teacher education universities appears to exceed, by a considerable amount, the projected demand in each of the five years, ranging from a low of 613 in 1971/72 to a high of 964 in 1975/76. At first glance there appears to be a serious oversupply in the making, but a number of factors must be considered before forming such conclusions.

1. This is an aggregate projection which does not distinguish separate occupational fields. Therefore, it is not possible to generalize from this table that all vocational fields will experience an oversupply. In fact, considerably more than half of the projected surplus is accounted for by excess vocational office teacher outputs. (Need for nonvocational office teachers is not included in this projection.) Despite the appearance of an oversupply in the aggregate, there are exceptions in nearly every occupational field, due to specializations for which there are few or no university outputs.

2. This projection is based upon the best information available, but is fraught with numerous uncertainties which accompany projection making. The primary assumption upon which these projections are built is that enrollments will increase at a 7-10% per annum growth rate. Other assumptions which the future could prove wrong are the 5% attrition rate among current stocks, the 30% attrition rate among initial certificate outputs, and the 1:60 teacher/student ratio.

3. Normally, when making projections of teacher demand, an allowance is made for replacement of substandard existing personnel. Replacement of existing teaching personnel holding substandard qualifications would lower the apparent oversupply, but this is difficult to accomplish because substandard personnel tend to exist in specialties for which there is very little university output.

An analysis of secondary vocational teachers actually in the schools for 1970/71 disclosed that only eight were teaching with "Special" certificates and forty-seven had "Life" certificates. The balance had either vocational provisional or permanent certificates (Table 33). This came as quite a surprise because of the known numbers of "Special" certificates issued each year. The answer seems to be that nearly all "Specials" are being issued to part-timers to teach in adult education programs. The

employers, which would tend to have a healthy effect upon the quality of the professional cadre. The considerable need for more cooperative coordinators who are capable of handling diversified as well as distributive programs could whittle down this marginal surplus (Table 70). Here, too, there is need for certain specialized personnel, who are extremely difficult to locate, such as "display" teachers required by some area vocational centers.

Expansion prospects for additional programs are below average, according to the Annual and Long-Range Program projections of secondary administrators (Table 17), which registered a 51% increase over the five-year period, as compared with 74% for all of secondary vocational education. The current economic restraints and their impact on quantities of good quality coop training stations have caused difficulties for local school administrators wishing to enlarge or implement new distributive education programs. Should economic conditions brighten, any apparent surplus could be rapidly wiped away.

Health occupations.--This projection shows a small annual new teacher requirement ranging up to a maximum of ten per year. Since there is virtually no university supply of degree graduates with initial certification, the health occupation projection table could not be completed as were those of the other occupational fields (Table 74). Should secondary-level occupational programs in health service take hold, particularly at the area vocational centers, these projections would be rendered completely inadequate. As soon as two years from now, actual health occupation teacher requirements could run much higher than those shown in the table. The demand for health occupation personnel will increase as secondary institutions assume more responsibility for preparing nontechnician-level persons for health occupations.

Another indicator of the inappropriateness of the health occupation teacher projections is the need for eighteen health teachers in 1971/72 and a like number for the following year, according to secondary vocational administrator interviews (Table 70). This amounts to triple the number indicated, and lends evidence to the expectation that health education programs have considerable expansion potential. The Annual and Long Range Program projections show 96% increase in a five-year period, thus confirming the expansion potential (Table 17).

Since there is no university output of graduates with teacher education, these posts need to be filled from other sources, at least temporarily, until university programs can be implemented to cover the various health occupation specialties. Our survey indicates that community college health occupation personnel (secondary-level response numbers were too small to use) are recruited from the following sources (Table 75).

TABLE 75.--MAJOR ACTIVITY PRIOR TO CURRENT COMMUNITY COLLEGE EMPLOYMENT

Employment	Number
Employment in Education	
1. Nonteaching--(Administrator, Consultant, etc.)	18
2. Teacher, Private School	3
3. Teacher, Secondary Nonvocational	2
4. Teacher, Secondary Vocational	2
5. Teacher, Post-Secondary Nonoccupational	2
6. Teacher, Post-Secondary Vocational Occupational	20
Non-Education Employment	
7. Business, Industry, Agriculture	12
8. Social and Personal Services	15
9. Military Service	1
10. Homemaking and Nonwage Earning	14
Student Formal Education Studies	
11. Student, Degree with Teacher Education	8
12. Student, Degree without Teacher Education	3
13. Student, Community College Occupational Training	2
14. Student, Private Occupational School	0
Other	18
TOTAL	120

It is quite likely that the same pattern of recruitment will prevail at the secondary level for most of the period covered by this study, with some increase beginning to appear in the "Student, Degree with teacher education" toward the mid-1970's, when the first outputs from new university health teacher programs could emerge.

Home Economics.--There appears to be a moderate oversupply of home economics teachers in the offing (Table 74). This number will actually be less, because of the need to apply a higher annual attrition rate to the existing stocks of teachers, perhaps as much as 10% per annum. This would remove fifty to seventy-five teachers annually from their projected surplus. Preservice attrition may tend to be greater than the 30% assumed, thus further reducing the apparent surplus. Contrawise, the rate of return of former teachers is probably higher for home economics teachers than for most other groups, thus tending to diminish the need for beginning teachers. It is significant to note that the expansion potential of home economics was the highest registered in the Annual and Long-Range Program plans, amounting to 267% for the five-year period. The starting and ending quantities were the smallest of all occupational areas, however (Table 17).

As with agricultural teachers, the most serious problem is lack of outputs with needed specifications, specifically the wage-earning occupations, such as food service, child care, and clothing and related occupations. Many secondary school employers expressed difficulty in finding teachers who possessed practical work experience and degrees that would qualify them to teach wage-earning home economics. The exact size of the demand is unknown, but secondary area vocational centers show a steady demand of twelve per year (Table 69). Adding to this, K-12 school district requirements for wage-earning occupations may double the annual need, perhaps totaling twenty to twenty-five per annum by 1975/76.

The preservice supply of wage-earning home economics teachers is very small, and little other than a few workshops were in evidence for inservice teachers. Until outputs from new preservice university programs can be felt, teachers of wage-earning home economics occupations will continue to be secured from local businesses and industries, and inservice teacher stocks who can be readied through special courses and cooperative work experience.

Office.--There is an apparent oversupply of vocational office education teachers, the magnitude of which will increase, according to these projections. (This statement does not include general office or business teacher output, for such was not the purpose of this Report.) Data from employer interviews show office as being among the occupational areas having the lowest total five-year need, thus confirming the potential massiveness of the oversupply (Table 70). As recently as 1969/70, however, most placement directors reported successful placement for nearly all new office education graduates who were willing to move to where the job openings existed. Annual and Long-Range Program projections indicated a 41% growth over a five-year period, which is considerably below the 74% average for all of secondary vocational education (Table 17). The preservice attrition rate among new graduates in office education is considerably higher than 30% assumed rate (Table 54). This fact, and the possibility that inservice attrition may exceed the assumed 5% rate, will tend to reduce the apparent oversupply, but not sufficiently to remove the necessity for teacher education institutions collectively to reconsider their output patterns.

As in other occupational areas, specific subject areas are in short supply, the most obvious of which is data processing. Employers are finding it a bit easier to hire data processing teachers, but they usually lack desired qualities supplied by degrees and teacher education.

Replacement of persons with substandard certification is no longer a problem in office education, since existing stocks are almost exclusively regular certificate holders. Office teacher education has reached the enviable position where it may shift emphasis from quantities of personnel to improving the competencies of its existing inservice teachers, and to being more selective in preservice output specializations.

Trade and Industry.--The output of new graduates appears on the surface to be in rather definite oversupply (Table 74), but employer interviews clearly indicated that trade and industrial staffing provided most of their headaches. The problem is that demands are for numerous specialties which do not match up well with the specializations possessed by the new degree outputs. There are many specialties for which there is little or no preservice output from universities. As a result, persons must be recruited from other sources. Specifics of this situation are reviewed later.

Replacement of personnel holding substandard teacher certification may be regarded as having little impact on increasing new teacher requirements, since employers regard most of these persons as capable teachers worth retaining and consequently would prefer to upgrade their qualifications through inservice activities. Furthermore, replacements for the specialties under consideration are not generally available from teacher education colleges.

Annual and Long-Range Program plans showed trade and industry to have a 105% expansion rate for a five-year period, which is well over the 74% for all vocational education, thus reflecting a strong growth potential and consequent above-average need for more teachers than is shown in Table 74. Moreover, employer interviews indicated nearly half of the expansion needs to be for trade and industrial teachers (Table 70). These interviews disclosed a 1971/72 requirement for 148 new people, which nearly equals the projected available new graduate outputs without adding replacement requirements for inservice teacher attrition (Table 74).

Community colleges do hire some new graduates with teacher education for certain trade and industrial positions, although they generally prefer more mature and experienced persons. Consequently the apparent oversupply of new graduates would be further diminished by community college hirings, perhaps by ten per year, but the problem of matching specializations creeps in again.

Our survey of trade and industrial teacher recruitment sources for existing area vocational centers shows 33% from within the education system, 14% from new university outputs with teacher education qualifications, and 52% from business and industry. Thus slightly more than half came from the latter, and most of them are not likely to have held standard vocational certification qualifications. Whether this pattern favoring the business and industry source was due to necessity or to preference is a pertinent question. The answer is a clear-cut "both." Some school employers expressed preference for the nonuniversity graduate for some posts.

Coop Coordinators.--Employer interviews disclosed a demand for cooperative coordinators amounting to from twenty-five to thirty per annum (Table 70). Since most of these personnel, other than distributive education, are selected from the ranks of existing teachers, there

is no real point in trying to gauge a supply-and-demand relationship. The focus of existing and future problems is likely to be qualitative rather than quantitative; thus emphasis should be on inservice development of competencies appropriate to the coordination task. Preservice orientation to cooperative work experience in the form of a course or unit in a course should be required of all vocational education candidates.

In summary, it appears there will be a moderate oversupply of university graduates with initial teaching qualifications for regular secondary vocational programs, exclusive of adult education. The oversupply will be most noticeable in office education, with a small problem possible in nonwage earning home economics and in some fields of trade and industrial education. Distributive education shows a slight oversupply. There is likely to be an undersupply in agriculture, health, and in wage-earning home economics. In addition, there are specialties in each of the occupational fields for which there is little or no baccalaureate teacher production, and thus more shortages. This is particularly true in trade and industrial education, with its many specialized programs.

Total Post-Secondary Teacher Requirements by Projection

Requirements for post-secondary teaching personnel in each subject are projected using student enrollment projections from Section II and teacher-to-student ratios, as established in the second column of Table 76. The results are reported by occupational codes with high and low ranges for each year. They constitute the total number of teachers to be engaged, inclusive of existing stocks, replacements, and additions.

Net Requirements for New Post-Secondary Occupational Teachers

The aggregate demand for new post-secondary teaching personnel minus existing stocks yields a projected total new teacher requirement (Table 77). Existing stocks for each successive year are reduced by a 7% attrition allowance before being assumed as the existing stocks for the following years. The 7% attrition rate is based on 1969/70 experience of community college occupational deans. Hence the total new teacher requirement includes replacement and additional teacher requirements.

TABLE 76.--PROJECTED TOTAL POST-SECONDARY TEACHER REQUIREMENT RANGE, DISAGGREGATED BY OCCUPATIONAL CODE, 1971/72-1975/76

Occupational Code	1969/70 Teacher/Student Ratio[a]	1971/72		1972/73		1973/74		1974/75		1975/76	
		Low	High	Low	High	Low	High	Low	High	Low	High
01 Agric.	1:20	42	48	47	55	51	64	56	75	62	88
04 D.E.	1:37	93	104	102	121	112	141	123	164	136	192
07 Health	1:12	399	447	439	521	483	607	531	707	584	824
09 Home Ec	1:8	37	42	41	48	45	56	49	66	54	77
14 Office	1:36	361	405	397	472	437	550	481	641	529	747
16 Tech	1:20	468	525	515	612	566	712	623	830	685	967
17 T&I	1:20	527	591	580	689	638	803	702	935	772	1089

[a]Overall post-secondary teacher/student ratio was 1:22 in 1969/70.

TABLE 77.--NET QUANTITATIVE REQUIREMENTS FOR NEW POST-SECONDARY TEACHERS

Year		Aggregate Demand	Existing Stocks[a]	Total New Teacher Requirements[b]
SUMMARY - 53% Full-Timers[c]				
1971/72	Low	1925	1627	268
	High	2159	1723	436
1972/73	Low	2117	1790	327
	High	2515	2008	507
1973/74	Low	2329	1969	360
	High	2930	2339	591
1974/75	Low	2562	2166	396
	High	3414	2725	689
1975/76	Low	2818	2383	435
	High	3977	3175	802
04 DISTRIBUTIVE - 55% Full-Timers[c]				
1971/72	Low	93	78	15
	High	104	83	21
1972/73	Low	102	86	16
	High	121	97	24
1973/74	Low	112	95	17
	High	141	113	28
1974/75	Low	123	104	19
	High	164	131	33
1975/76	Low	136	114	22
	High	192	153	39
01 AGRICULTURE - 60% Full-Timers[c]				
1971/72	Low	42	36	6
	High	48	38	10
1972/73	Low	47	39	8
	High	55	45	10
1973/74	Low	51	44	7
	High	64	51	13
1974/75	Low	56	47	9
	High	75	60	15
1975/76	Low	62	52	10
	High	88	70	18
07 HEALTH - 68% Full-Timers[c]				
1971/72	Low	399	338	61
	High	447	357	90
1972/73	Low	439	371	68
	High	521	416	105
1973/74	Low	483	408	75
	High	607	485	122
1974/75	Low	531	449	82
	High	707	565	142
1975/76	Low	584	494	90
	High	824	658	166

09 HOME EC. - 22% Full-Timers[c]

1971/72	Low	37	32	5
	High	42	33	9
1972/73	Low	41	34	7
	High	48	39	9
1973/74	Low	45	38	7
	High	56	45	11
1974/75	Low	49	42	7
	High	66	52	14
1975/76	Low	54	46	8
	High	77	61	16

16 TECHNICAL - 46% Full-Timers[c]

1971/72	Low	468	395	73
	High	525	419	106
1972/73	Low	515	435	80
	High	612	488	124
1973/74	Low	566	479	87
	High	712	569	143
1974/75	Low	623	526	97
	High	830	662	168
1975/76	Low	685	579	106
	High	967	772	195

14 OFFICE - 40% Full-Timers[c]

1971/72	Low	351	305	46
	High	394	324	70
1972/73	Low	386	326	60
	High	459	366	93
1973/74	Low	425	359	66
	High	535	427	108
1974/75	Low	468	395	73
	High	623	498	125
1975/76	Low	514	435	79
	High	726	579	147

17 TRADE AND INDUSTRIAL - 57% Full-Timers[c]

1971/72	Low	527	445	82
	High	591	472	119
1972/73	Low	580	490	90
	High	689	550	139
1973/74	Low	638	539	99
	High	803	641	162
1974/75	Low	702	593	109
	High	935	747	188
1975/76	Low	772	653	119
	High	1089	870	219

[a]Stocks from previous year, less 7% for attrition.

[b]Aggregate demand minus existing stocks. Inclusive of additional positions and replacements, also full- and part-time.

[c]Indicates the percentage of full-time personnel during 1969/70 which could be applied to the projections below to disaggregate full- and part-time teacher requirements.

Table 77 was not developed to show the impact of the supply of new graduates with initial certification upon the total new teacher requirements, because community college deans do not regard them as a first-line source. With exceptions, this group tends to lack the desired experience and seasoning. It is recognized, however, that some do go into post-secondary teaching immediately, and that for some situations this may be the only solution. Our survey shows that primary sources of full-time community college teachers were: 46.1% from employment in education, 36.5% from noneducation employment, 12.3% from student status, and 5% other. Only half of the 12.3% recruited from the graduating student source possessed a degree with teacher education. (Nearly 75% of the part-timers are recruited from noneducation employment.) These percentages are useful for gauging possible quantities likely to be recruited from these same sources in the future, provided conditions remain roughly the same.

Nearly 15% of the community college occupational teachers polled were recruited from out-of-state sources, which is the result of in-state shortage and definite attempts on the part of some deans to recruit from external sources as a matter of policy. Surprisingly, only two of the 436 surveyed were recruited from the military. Studies by Hensel (16) and Richland (22) highlighted considerable possibilities of this source, particularly for teachers in electrical and mechanical occupations.

Word received as this report was undergoing final preparation indicated that community college occupational teacher "Approvals" by the State Vocational Education Services office are being eliminated, thus giving community college deans considerably more latitude when recruiting staff. This will clear the way for local-level decision making as to the appropriateness of teacher qualifications, and will probably cause some change in the established recruitment sources pattern.

The total new post-secondary teacher requirements must be regarded for exactly what they are, that is, projections into the future based upon a number of assumptions (Table 77). These assumptions include a 10 to 16% per annum enrollment increase rate and 7% annual attrition rate among current teacher stocks. It should be noted that, as a result, both the replacement and additional teacher requirements accumulate at a faster rate for post-secondary teachers than for secondary teachers. Further, the total annual new teacher

requirement for post-secondary teachers starts lower than that of secondary teachers but ends at a higher point.

The summary projections of Table 77 are disaggregated along occupational lines, thus producing new community college teacher requirements for each major occupational field. The projected total new teacher requirements are inclusive of full- and part-time personnel, with the percentage of the former being indicated at the head of each section. The percentages are based on 1969/70 totals of the State Vocational Education Services, which include only reimbursed faculty and therefore are not inclusive of all pertinent faculty at all schools.

A review of post-secondary Annual and Long-Range Program Plan (Table 22) and community college occupational dean interviews (Table 71), in light of the new teacher requirement porjections (Table 77), precipitates additional comment. However, first it should be noted that the post-secondary Annual and Long-Range Plan included only twenty-one of twenty-nine community colleges; hence it is far from being as comprehensive as desired.

Agriculture.--New agricultural teacher requirements will be the lowest of all areas, according to the indicators, but will be characterized by newly emerging occupational fields like natural resources and agribusiness. The needs are likely to total from six to ten per annum. These positions will probably be filled with university graduates possessing majors in closely related specialties, who have had pertinent field experience.

Distributive.--Distributive education teacher demand appears to be about correct as projected in Table 77, perhaps requiring fifteen to twenty-five per year. These persons are most likely to be graduates with considerable business experience.

Health.--Since health occupations programs have excellent growth potential, particularly at this level, and employer interviews indicated them to have the second highest total demand for the five-year period, additions can be expected at a rate of thirty to forty full-timers per annum until the saturation point is reached. This may occur before 1975/76. The balance of the needs will be supplied by part-timers from the local community. In fact, there has been and will continue to be heavy reliance upon these persons, although very few

will have had courses in organizing, presenting, and evaluating instruction.

One of the most puzzling paradoxes encountered in the process of preparing this report is the contrast between Annual and Long-Range Program projections for health occupations which is unusually low (Table 22) and, on the contrary, interviews with all twenty-nine community colleges, which clearly indicated health occupations as one of the fields in which most expansion would take place (Table 71). A variety of explanations can be imagined, one being incomplete responses with only twenty-one of twenty-nine community colleges responding to the survey.

Home Economics.--The few additions in home economics will be almost exclusively in wage-earning fields, and the quantities are likely to be about as shown in Table 77, ranging from five to ten per year. More than 75% of teachers in this field were part-timers 1969/70. Recruitment sources are likely to be varied, but with emphasis on individuals with appropriate work experience and university degrees, if possible.

Office.--Office education expansions, according to the Annual and Long-Range Plan, show a significant increase, but anticipated additions per annum as determined by employer interviews are low, amounting to about ten full-time staffers per year. Perhaps a range from ten to twenty per year is valid, with the balance being filled by part-time personnel from local communities. Interviews with deans revealed that business and office programs in many community colleges have already reached optimum levels of full-time personnel, and that additional staffing requirements are being satisfied with part-time teachers from the local community.

Trade and Technical.--Trade and technical expansion plans, according to the Annual and Long-Range Plan, amount to 125% for five years (Table 22). Although the line of distinction between technical and trade programs is not as clear-cut in practice as it may be in theory, the expansion rate of the technical section is slightly higher than that of the trade section. Teacher requirements for the five years outnumbered all other occupational areas, according to the employer interviews, amounting to an average of nearly thirty full-timers per

year (Table 71). It can be expected that this number will become somewhat higher, perhaps thirty to fifty additional personnel per year.

Our survey indicates that full-time trade and technical faculty were recruited as follows: employment in education 52%, noneducation employment 33%, new graduates 12%, and other 3%. Eighty-three per cent of the part-time staff were from noneducation employment.

The total community college teacher staffing pattern is likely to shift further in favor of the part-time instructor, since this solution offers more staffing flexibility once a nucleus of full-time faculty has been developed. A reservoir of part-time staff can be cultivated, to be available on call. Use of part-timers is also attractive, since the cost is less, as is the commitment to individuals regarding such matters as tenure and fringe benefits. Some concern is expressed, however, as to the long-range effects this trend may have upon the quality of instruction. Here, then, is a critical, statewide personnel development problem which employers, teacher educators, and the State Office should solve without delay.

Total Adult Education Teacher Requirements by Projection

Teacher requirements for adult vocational education are projected through 1975/76 by occupational fields, using the teacher/student ratios established in the second column of Table 78; the results are reported in the same table. Again it should be noted that a vast majority of these teachers are part-time personnel. No valid projections for administrators and ancillary personnel can be made from these projections, since in practice these requirements are dependent upon factors other than professional personnel-to-student ratios.

Net Requirements for New Adult Program Teachers

The net requirement for new adult program teachers is presented in Table 79. The aggregate demand minus existing stocks yield the projected total new teacher requirement. Existing stocks for each successive year are reduced by 10% attrition allowance before being assumed as the stocks for the following years. The 10%

TABLE 78.--PROJECTED TOTAL ADULT TEACHER REQUIREMENT RANGE, DISAGGREGATED BY OCCUPATIONAL CODE, 1971/72-1975/76

Occupational Code	1969/71 Teacher/Student Ratio[a]	1971/72		1972/73		1973/74		1974/75		1975/76	
		Low	High	Low	High	Low	High	Low	High	Low	High
01 Agric.	1:23	48	50	51	53	54	58	57	62	60	66
04 D.E.	1:54	389	404	413	435	438	469	464	504	492	540
07 Health	1:20	48	50	51	54	54	58	57	62	61	67
09 Home Ec	1:62	335	347	355	374	377	403	399	433	423	464
14 Office	1:28	427	443	453	477	480	514	509	552	540	593
16 Tech	1:13	180	186	191	201	202	216	214	233	227	249
17 T&I	1:45	1759	1824	1866	1967	1979	2118	2098	2276	2223	2441

[a]Overall adult education teacher/student ratio was 1:43.

TABLE 79.--NET QUANTITATIVE REQUIREMENTS FOR NEW ADULT TEACHERS

Year		Aggregate Demand	Existing Stocks[a]	Total New Teacher Requirements[b]
SUMMARY - 92% Part-Timers[c]				
1971/72	Low	3196	2711	485
	High	3314	2762	552
1972/73	Low	3391	2876	515
	High	3574	2983	591
1973/74	Low	3596	3052	544
	High	3848	3217	631
1974/75	Low	3811	3236	575
	High	4135	3463	672
1975/76	Low	4039	3430	609
	High	4435	3722	713
04 DISTRIBUTIVE - 94% Part-Timers[c]				
1971/72	Low	389	330	59
	High	404	337	67
1972/73	Low	413	350	63
	High	435	364	71
1973/74	Low	438	372	66
	High	469	392	77
1974/75	Low	464	394	70
	High	504	422	82
1975/76	Low	492	418	74
	High	540	454	86
01 AGRICULTURE - 100% Part-Timers[c]				
1971/72	Low	48	41	7
	High	50	41	9
1972/73	Low	51	43	8
	High	53	45	8
1973/74	Low	54	46	8
	High	58	48	10
1974/75	Low	57	49	8
	High	62	52	10
1975/76	Low	60	51	9
	High	66	56	10
07 HEALTH - 93% Part-Timers[c]				
1971/72	Low	48	41	7
	High	50	41	9
1972/73	Low	51	43	8
	High	54	45	9
1973/74	Low	54	46	8
	High	58	49	9
1974/75	Low	57	49	8
	High	62	52	10
1975/76	Low	61	51	10
	High	67	56	11

09 HOME EC. - 100% Part-Timers[c]

1971/72	Low	335	284	51
	High	347	289	58
1972/73	Low	355	302	53
	High	374	312	62
1973/74	Low	377	320	57
	High	403	337	66
1974/75	Low	399	339	60
	High	433	363	70
1975/76	Low	423	359	64
	High	464	390	74

16 TECHNICAL - 96% Part-Timers[c]

1971/72	Low	180	152	28
	High	186	156	30
1972/73	Low	191	162	29
	High	201	167	34
1973/74	Low	202	172	30
	High	216	181	35
1974/75	Low	214	182	32
	High	233	194	39
1975/76	Low	227	193	34
	High	249	210	39

14 OFFICE - 94% Part-Timers[c]

1971/72	Low	427	362	65
	High	443	369	74
1972/73	Low	453	384	69
	High	477	399	78
1973/74	Low	480	408	72
	High	514	429	85
1974/75	Low	509	432	77
	High	552	463	89
1975/76	Low	540	458	82
	High	593	497	96

17 TRADE AND INDUSTRIAL - 89% Part-Timers[c]

1971/72	Low	1759	1492	267
	High	1824	1520	304
1972/73	Low	1866	1583	283
	High	1967	1642	325
1973/74	Low	1979	1679	300
	High	2118	1770	348
1974/75	Low	2098	1781	317
	High	2276	1906	370
1975/76	Low	2223	1888	335
	High	2441	2048	393

[a]Stocks from previous year, less 10% for attrition.

[b]Aggregate demand minus existing stocks. Inclusive of additional positions and replacements, also full- and part-timers.

[c]Indicates the percentage of part-time personnel during 1969/70 which could be applied to the projections below to disaggregate full- and part-time teacher requirements.

attrition rate is an estimate. It is likely to be higher than either secondary or post-secondary attrition rates because the vast majority are part-time personnel, and the specific programs offered are much more subject to fluctuation in budget and adult student demands. Hence the total new teacher requirement includes replacement and additional teacher requirements. It is significant to note that the magnitude of the total new teacher requirement is similar to that of secondary and post-secondary programs. This net requirement for new adult education teachers must be regarded for precisely what it is, a projection based upon the best information available and certain assumptions, but it is saturated with more than the usual number of uncertainties which are inherent in making projections. The assumptions made include a 6 to 7.6% annual enrollment increase range and a 10% annual attrition rate among existing stocks. Most of the previous comments made with regard to secondary and post-secondary projections also apply to these projections.

The vast majority of the total new teacher requirement will be filled by part-time persons from the community and by existing secondary or community college teachers who are willing to teach adult courses on a part-time or overload basis. For this reason it was inappropriate to consider the impact of new college graduates with initial certification upon the total new adult teacher requirement. As in the past, these courses will be staffed with available persons.

The implication for personnel development is that of lending assistnace to the part-time teacher hired from the community, who needs help with course planning methods, techniques, evaluation, etc. Some of this need will be met by administrators of adult programs as their time permits, but assistance from teacher educators and others would be desirable in preparing individualized instructional packages for these part-time teachers.

Occupational Specializations Which Were Difficult to Fill

Vocational-technical administrators of local districts, area vocational centers, and community college programs were interviewed to locate specializations which had been or which were expected to be difficult to fill. They were also asked to indicate programs which were easy to staff. The results are reported by occupational code.

01 Agriculture: Clear-cut difficulty was expressed in finding teachers for retail plant sales, greenhouse and nursery, floriculture, and natural resources.

04 Distributive: Staffing in this field was rated among the easiest, with some exceptions, including teachers of merchandise display.

07 Health: Much difficulty was recorded in securing most types of health occupations teachers. Extremely few meet regular vocational teacher certification standards, many do not possess degrees, and almost none have had teacher education instruction.

09 Home Economics--Wage Earning: Staffing in this field was rated as quite difficult. There were sufficient home economics teachers available, but those with appropriate work experience were rare. Commercial food service teachers were very scarce.

14 Office: Securing these personnel was rated relatively easy, with an exception in data processing, but this appeared to be moderating somewhat.

16 and 17 Technical and Trade: This area was rated as the most difficult, with special recruitment problems occurring in air conditioning (heating, ventilation, and refrigeration), large appliance repair, automotive, small engines, electricity and electronics, and to a lesser extent building construction. Drafting was rated as easy to supply with machine trades teachers tending in this direction.

As to ancillary personnel, vocational guidance and placement personnel were regarded as very difficult to secure, while cooperative coordinators were about average in difficulty, and paraprofessionals relatively easy because they could be hired and trained locally. Personnel for all types of special needs programs were regarded as being among the most difficult to secure. Some paraprofessionals were being utilized in the absence of regular professionals, and often by design.

In some fields it was impossible to find individuals with college degrees, teacher education courses, adequate work experience, and recognized training or licensing in their specialties. Therefore administrators were compelled to seek nondegree personnel from business and industry with adequate work experience for

some full-time positions. Despite this compromise, administrators frequently continued to encounter difficulty with certain specialties, such as appliance repair and merchandise display.

As another measure of occupational specialties for which it was difficult to secure teaching personnel, administrators were asked to specify positions which went unfilled when school opened in the fall of 1970; that is, positions for which they could not find persons with appropriate qualifications. Unfilled positions included two each in degree nursing, business administration and law, and heating (air conditioning, ventilation, and refrigeration), with one each in data processing, large appliance, industrial electronics with logic circuitry, mechanical technology, welding, civil technology, and fluid power.

Of special significance to those responsible for preservice personnel development are the specialization requirements of administrators for the years immediately ahead. These are presented as Appendices 13, 14, and 15, and furnish the detail upon which Tables 68, 69 and 71 are based. They constitute a quantitative synthesis of specialties needed by program level, occupational code, and year, using the job title terminology of the administrators interviewed. Specialties are classified in major occupational fields using the United States Office of Education occupational code as a guide (80).

Comparison of the above specializations sought by school employers with the specializations available at the several universities (Table 49) reveals a long list of voids, specializations for which there were no university outputs of new graduates with initial vocational teacher qualification. The list of voids follows. There were many more specializations not listed for which programs exist at one institution only, but this may be entirely adequate for many specialties.

01 Agriculture: Agri-business, floral arrangement, natural resources, retail plant sales, sod and turf, urban agriculture production.

04 Distributive: Advertising, display, hotel and motel management, recreation and parks management.

07 Health: All specialties, with possible exceptions at Northern Michigan University with a home economics listing "Health Related Occupations" and at Wayne State University with a technical and trade listing of "Health." (Ferris State College will begin 1971/72.)

09 Home Economics: All specialties listed in Appendices 12, 13 and 14, with exception of specialties offered at Northern Michigan University in occupational commercial foods, child development, and clothing and related occupations, but outputs are very small.

14 Office: Court recorder and office communications.

16 and 17 Technical and Trade: Appliance repair, office machine repair, industrial mechanics, fluid power, marine mechanics, small engine and recreation equipment, service station operator, building maintenance, casting, civil surveying, farriery (horseshoeing), materials testing and construction, manufacturing engineering, mechanical technology, painting and decorating, photography, plumbing, commercial art, community and public service, law enforcement, and sanitation and water.

How to satisfy demands for teachers qualified in the myriad of specialties required is one of the most serious dilemmas facing those responsible for teacher education. The total five-year demand for a large majority of these specializations amounts to five or less for each field, hardly enough to warrant the mounting of preservice undergraduate or post-graduate specialized curricula. Furthermore, the demand for some of the specialties tends to fluctuate. Much of the dilemma would disappear if all vocational-technical curricula in the schools were to shift toward the cluster concept, but although some shift is happening to a limited extent, this solution to the problem is but wishful thinking. Highly specialized programs will continue to exist.

Administrator/Supervisor/Director Requirements

Secondary Administrators

Reimbursed secondary vocational administrative personnel existed at a ratio of 1:41 reimbursed vocational teachers in 1970/71. Application of this ratio to combined secondary vocational teacher projections (Table 72)

indicates possible total secondary administrative personnel requirements for the period under study as shown in Table 80. Between five to ten additional secondary administrators per annum may be needed. However, employer interviews revealed need for a total of only nineteen additional secondary administrators for five future years (Table 70). But this does not allow for the opening of new area centers, nor does it fathom well the requirements after 1972/73.

TABLE 80.--PROJECTED SECONDARY ADMINISTRATOR REQUIREMENTS 1970/71-1975/76*

Year	Low	High
1970/71	74	76
1971/72	79	84
1972/73	85	92
1973/74	91	101
1974/75	97	111
1975/76	104	122

*Vocational administrator-to-teacher ratio was about 1:41, using 1970/71 administrator totals and 1970/71 teacher projections.

State Vocational Education Services planning calls for reimbursing fewer administrative personnel at the local district level, and instead using these funds for reimbursing shared-time administrators, that is, vocational administrators who represent a group of local districts. Thus some local districts can be expected to continue their vocational directors on 100% local funds, while others are likely to drop the position or enter into shared-time arrangements with neighboring districts. As funding for area vocational centers is clarified and additional centers materialize, more administrators and ancillary personnel will be employed. If approximately seventy-five secondary area vocational centers are eventually established in this decade, a minimum of 150 administrators would be needed. It is expected, however, that the increase will tend to be small for the next five years, possibly resembling the lower end of the range as projected in Table 80, which

would mean from five to seven each year for a total of twenty-five to thirty-five over the five future years. To this must be added an allowance for attrition, which at an assumed rate of 5% per year (same as secondary teacher attrition) amounts to about four replacements per annum or twenty over the five year period. Thus a total of nine to eleven secondary administrators per year or forty-five to fifty-five over five years will be needed.

It is expected these personnel will be secured from within the existing secondary education system, not from business and industry or directly from university training. In fact, according to our survey, 86% of the secondary area vocational center administrators were appointed from within education.

Post-Secondary Administrators

A projection of total post-secondary occupational program administrative requirements using the existing administrator-to-teacher ratio of 1:22 is shown in Table 81. These results, even the low range, are highly unlikely, however, since they indicate additions too great in magnitude when considering other factors, thus illustrating a weakness of this projection method. The low 1:22 administrator-to-teacher ratio hints of a potential for existing administrators to absorb more programs, personnel, and enrollments within existing quantities.

TABLE 81.--PROJECTED POST-SECONDARY ADMINISTRATOR REQUIREMENTS 1970/71-1975/76*

Year	Low	High
1970/71	80	84
1971/72	87	98
1972/73	96	114
1973/74	106	133
1974/75	116	155
1975/76	128	181

*Post-secondary occupational administrator-to-teacher ratio was approximately 1:22, using 1970/71 administrator total and 1970/71 teacher projections.

Furthermore, there appears to be but little demand for additional administrators, deans, and directors of community college occupational programs, according to interviews summarized in Table 71. The administrative staffs of these schools were largely staffed during the 1960's. Only if new community colleges are established is there likely to be much demand for additional administrative personnel. As the situation is at present, only a few administrators will be added. Replacements of existing administrative personnel will probably be very small, since very few will reach retirement age during the five years under study, and these positions are highly coveted in the profession. If an attrition rate of 3-4% per annum (one-half that of community college teachers) is applied, there will be need for approximately three replacements per year, or about fifteen over the five-year period. Add to this an equal number of additional administrative personnel and a total need for six per year or about thirty for five years results. According to our survey, these persons are likely to be advanced from within education (69%) or be hired from business and industry (27%).

The combined projections for additional secondary and post-secondary administrative personnel needs total 15-17 per year, or 75-85 over the 5-year period.

Employer interviews did not directly cover adult vocational education administrative staffing needs, since these tend to be covered by existing vocational-technical administrators at the secondary and post-secondary levels. There could be a need for additional personnel to administer adult vocational education programs at the community college level if State Vocational Service plans are implemented to focus this responsibility on the community colleges. In interest of financial savings, however, much of this responsibility might well be absorbed by existing personnel, thus diminishing requirements for additions.

Consultant and Specialist Requirements

A need for additional consultants and specialists in the State Vocational Education and Career Development Services is apparent at many points, but a variety of factors make it very difficult to anticipate quantitative and qualitative dimensions. These include serious budgetary constraints which may persist for a considerable period of time, and which will probably allow for little

more than replacement of departing personnel; several new thrusts or emphases in the making; and a changing role of the Vocational Education Service in its function with local school units. State Office personnel will no longer be functioning primarily as specialists in occupational fields. The new emphasis is upon broad-gauged competence in occupational programs at specific levels. As time passes, more of their work will be with local administrators and consultants in program-planning, implementation, and curriculum development. If and when tentative state plans for intermediate school district and community college redistricting are implemented, the changed role will be fully upon these personnel. No longer will they work as directly with teachers in local situations as they did formerly, but with an intermediate layer of program administrators and coordinators throughout the state, perhaps on a regional basis.

The demand for secondary consultants and specialists in program, curriculum, instructional materials, and media development appears to be small and shows a need for eleven over the five-year period (Table 70). Secondary area vocational center directors indicated they had hired three last year, but only plan to hire three more in the years ahead. Secondary and post-secondary programs alike typically make use of the general consultants and specialists provided by their schools, rather than employ such persons exclusively for vocational-technical education. This is usually a matter of necessity rather than choice.

If intermediate school district reorganization plans currently before the Michigan Senate are enacted, somewhere in the neighborhood of twenty education regions might be created, each of which could be expected to employ a vocational education consultant. Current stocks of vocational consultants and implementors employed by intermediate school districts total nineteen. Hence there appears to be need for very few additional consultants for these possible regional positions.

Replacements and additions are likely to total eight to ten per year, or forty to fifty over the five years ahead. The vast majority of consultants and specialists, perhaps 85-90%, come from within education, with very few coming directly in from student status or from business and industry.

Guidance and Placement Requirements

There is a noticeable need for guidance and placement personnel in the immediate future, particularly at the area vocational centers. The combined secondary and post-secondary vocational guidance demand is thirty-seven for the five future years, or six to seven per annum (Tables 70 and 71). These are persons who would be assigned specifically to vocational guidance and placement; they would not need to divide their time with general guidance duties.

Considerable frustration has been encountered by administrators in locating the kinds of guidance and placement personnel they desire. Much heat but little light is generated as to the kind of guidance persons being considered as appropriately qualified. Qualities most often mentioned were adequate work experience plus specialized training in vocational guidance. Of special significance is the need for vocational guidance personnel familiar with the area vocational center scheme and capable of working at either the centers or in the sending schools.

Many secondary vocational directors would like to have a large portion of the general guidance staff trained and experienced in working with vocational guidance, since financial constraints make it difficult to hire full-time vocational guidance personnel. Our personnel survey indicated that existing vocational guidance personnel are secured through a variety of channels, but their numbers are insufficient to make any generalizations as to predominant recruitment sources.

Researcher Requirements

The demand for full-time researchers is probably the smallest of all personnel types. They are most often employed by the Research Coordinating Unit of the State Department of Education and by universities. There is the possibility that two or three additions might be made to the State Research Coordinating Unit during the period of time under study. Comments on the need for university researchers appear later in this report. Full-time researchers are most often recruited from graduate schools, university faculties, and state departments of education in other states.

Paraprofessional Requirements

The need for paraprofessionals as an integral part of differentiated staffing is apparent in Michigan, according to employer interviews. Sixteen are reported to have been employed by secondary and post-secondary institutions last year. The same employers indicated plans for hiring approximately sixty additional paraprofessionals in the five years ahead. In fact, 64% of the employers interviewed indicated they now employ paraprofessionals or will be employing them in the very near future. Others were contemplating doing so. The intent is to use paraprofessionals in such assignments as operating audio-visual tutorial learning centers, supervising open laboratories, maintaining equipment and supplies, and in special needs programs. Many administrators regard employment of paraprofessionals as means for stretching budgets and improving the quality of instruction. Most current paraprofessionals are hired from local business and industry, and are trained on the job. Because of this and their small numbers, there would seem to be little need for organizing group training programs at this time. Using paraprofessionals for special needs programs and projects may necessitate group training sessions, however.

University Teacher Education Requirements

The need for additional faculty in university vocational-technical teacher education departments was ascertained through interviewing department heads. Due to fiscal constraints, it appeared that there would be very little hiring of additional faculty for the 1971/72 session, but as soon as the fiscal situation was clarified, institutions would move forward in employing approximately forty-five additional faculty members over a five-year period. Indications are that very few authorized but unfilled positions exist, and that the job descriptions will continue to emphasize occupational service areas rather than across-the-board, occupational education qualifications. Need for researchers *per se* was mentioned by only one institution, while only two indicated need for individuals with across-the-board competence in occupational education.

Apparently, the intent is to employ approximately fifteen business educators, ten home economics educators, eighteen industrial educators, and two occupational educators to fill new positions in the five years ahead. Health occupations personnel will also be needed, but were not mentioned by universities.

Attrition due to retirements in the five-year period ahead is likely to approximate fifteen. About an equal number of replacements may be needed, due to deaths and resignations. Therefore, the total demand for new teacher educators is likely to be in the neighborhood of seventy-five for the period, or fifteen per annum, analyzed annually as follows: nine new positions; three replacements due to retirement; and three replacements because of death and resignation. These estimates are based on interview data which are somewhat incomplete but appear to be adequate for making these judgments.

Summary of Personnel Requirements--Quantitative

A summary of the annual and five-year personnel requirements as outlined to this point are presented in Table 82, except for teacher personnel requirements which are stated in Tables 74, 77, and 79.

Personnel Requirements--Qualitative

Qualities Sought in Professional Personnel According to Vocational Administrator Interviews

Vocational-technical education employers, including community college deans, area center principals, and secondary directors, when asked to rank five commonly recognized qualities normally sought when hiring professional personnel, responded with the following composite ranking:

1st - Occupational experience
2nd - Personal qualities
3rd - University degrees
4th - Teaching experience
5th - Teacher training

TABLE 82.--QUANTITATIVE SUMMARY OF PERSONNEL NEEDS, 1971/72-1975/76[a]

Personnel Types	Additional Annual Requirement	Replacement Requirement Annual	Total Annual Requirement	Total Five-Year Requirement
Administrator/Supervisor (Secondary and Post-Secondary)	8-10	7	15-17	75-85
Consultant/Specialist	5- 7	3	8-10	40-50
Guidance/Placement	6- 7	1	7- 8	35-40
Research	(less than 1)	(less than 1)	1	4- 5
Paraprofessional	12	2	14	70
Teacher Educator	9	6	15	75

[a]Teacher personnel needs stated in Tables 74, 77, and 79.

Most employers desired to employ persons who would score high in all of these categories, but when asked to rank these in order of importance on a five-point scale, the above results materialized. It is not surprising that occupational experience was rated first. Personal qualities scored a very close second, with university degrees and teaching experience being rated nearly alike. It is extremely significant that possessing teacher training qualifications was rated a clear-cut last. It must be added that employers desired to find staff with teacher training, since they were not enamored with the prospect of hiring individuals who would need extra inservice training attention, but it is on this quality that they would compromise sooner than any of the others. One can read all sorts of explanations into this condition. But when given the alternative of choosing between individuals with strong backgrounds in teacher education and teaching experience but lacking in work experience, or persons competent in their occupational area as witnessed by work experience and specialized training but lacking in teaching experience and teacher training, most administrators would choose the latter, since they seemed to regard the upgrading of teaching skills as being more feasible than attempting to bolster an individual's work experience background. Community college deans tended to put more weight on the importance of college degrees than did secondary administrators, but their overall rankings were in agreement.

Qualities Sought in Vocational-Technical Personnel According to Cooperative Coordinator, Administrator, State Office Consultant, and Teacher Educator Conferences

A major thrust throughout the course of this entire study has been the identification of qualities needed by vocational-technical personnel to function adequately in the years ahead. Primary reliance was placed upon the judgments and opinions of the various personnel types, as gathered at special group conferences and individual interviews. Thus groups and individuals were asked to specify the needs of their own professional groups and to assist, as well, in naming those of other professional types with whom they had frequent contact.

The often-mentioned individual interviews with administrators, consultants, and teacher educators included questions on the qualities sought in professional personnel. In addition, four conferences were held at various locations during the Spring of 1971 to identify competencies and training needs through use of group discussion procedures. Emphasis was placed upon the identification of needs, not ways and means for their achievement. Time was provided at the MCLAVEPA Conference (vocational administrators) in Traverse City for administrators and consultants to identify competencies and training needs of their field. Meetings with consultants and administrators of the State Vocational Services Office were held in Lansing. A one-day conference of vocational-technical teacher educators representing all the occupational services was held at the Kellogg Center in East Lansing in May. This was indicated to be the first such large, across-the-board vocational teacher education conference held in Michigan in well over ten years. Perhaps some of the side benefits of this conference were at least as important as the reason for which the conference was called. Time was provided at the annual Cooperative Coordinators Conference held at Midland in June for groups of these professionals to identify their most important professional development needs. Unfortunately, meetings of classroom teachers could not be included, due to limitations of time and resources.

The hundreds of suggestions collected through these group conferences and personal interviews were merged and synthesized to a considerable extent for presentation in this report. Original language is maintained wherever possible. These lists actually need further synthesis and subsequent conversion into behavioral or performance goal statements, but time does not allow such refinements. In their present form, however, they do constitute valuable reference lists for those concerned about meeting the personnel development needs of Michigan vocational-technical personnel in the years ahead. In his recent Ph.D. dissertation, Carlos Schmitt gave special attention to the needs of Michigan community college part-time vocational-technical instructors (23).

The lists of competencies and training needs which follow are arranged by personnel types in this order: teachers, cooperative coordinators, administrators, consultants, guidance and placement workers, paraprofessionals, special needs workers and teacher educators.

Competencies and Training Needs of Secondary and Post-Secondary Occupational Teachers*

1. Working with students of diverse abilities and backgrounds.
2. Understanding differences existing between normal and special needs students.
3. Communicating skillfully with the disadvantaged.
4. Changing student behavior in concert with current developments in psychology and sociology.
5. Determining how to change more adequately students' behavior regarding work adjustment problems; i.e., working with peers, how to accept and work with supervisors.
6. Knowing how learning best takes place.
7. Understanding and working with individuals who have wide ranges of abilities and occupational objectives.
8. Understandings in psychology of adolescence and relating to youth.
9. Skills in human relations--sensitivity training.
10. How to deal with explosive urban situations.
11. Helping trades people develop an understanding of student actions and reactions, developing a good curriculum, and ability to relate to the program and student.
12. Understanding vertically integrated curriculum and cluster oriented curriculum.
13. Developing curriculum plans with other personnel for area centers and supporting schools. Inter- and intra-school curriculum articulation, both horizontal and vertical.
14. Occupationally qualified teachers without professional teacher education need instruction in methods and techniques of teaching, developing vocational objectives, individualizing instruction, evaluation, and curriculum organization.
15. Individualizing instruction with use of various media, based on performance objectives.
16. Adapting curricula to the open entry-open exit concept.
17. Becoming more comfortable in establishing, accepting, and working with program objectives as related to accountability.
18. Preassessing students' characteristics.
19. Preparing and evaluating behavioral and performance goals.
20. Gathering data through employee interviews to develop real instructional units.
21. Familiarity with vocational development theory.
22. Weaving the concepts of career education into basic education programs.

---

*As identified by administrators/supervisors/directors, consultants/specialists, and teacher educators.

23. Applying task analysis.
24. Developing courses of instruction and syllabi.
25. All teachers K-12 need an orientation to the world of work concept.
26. Managing and organizing classrooms.
27. Using wider varieties of teaching methods and techniques.
28. Utilizing paraprofessionals effectively.
29. Functioning as an instructional manager.
30. Utilizing community resources.
31. Concrete approaches to evaluation.
32. Developing innovative instructional techniques.
33. Implementing programs.
34. Selecting instructional materials from the variety of kinds available.
35. Developing instructional materials.
36. Relating instructional materials to job clusters.
37. Recognizing and utilizing support services.
38. Understanding of the drug problem, racial issues, student dissent.
39. Implementing active advisory committees.
40. Improving knowledge and skills within particular occupational areas.
41. Update occupational specialties by periodic return to work, perhaps every third year, through coop type programs.
42. Written communication skills.
43. Coping with the nonreader.
44. Understanding the mission of the area center and/or community college.
45. Understanding the cluster concept.
46. Student placement procedures.
47. Lesson planning.
48. Agriculture teachers--competencies and motivation necessary to teach modern agri-business (both older and newer teachers).
49. Distributive teachers--determining performance objectives and task analysis.
50. Home economics teachers--need to be aware of the importance of consumer education for depressed areas.
51. Office teachers--individualizing instruction through project lab, multi-media, better use of business facilities, equipment, and personnel (including work experience).

Competencies and Training Needs
of Cooperative Coordinators*

1. Current developments re: state, federal, and local legislation regarding labor laws for youth, wage and hour laws, and unions.
2. Finding jobs by surveying potential places of employment.
3. Selecting students in regards to marks; screening students; placing students.
4. Using achievement tests.
5. Motivating noncompetitive students.
6. Developing appropriate instructional material for related instruction which is geared to the student's level.
7. Updating in data processing.
8. Improving salesmanship ability.
9. Starting a program.
10. Working with advisory committees.
11. Communicating effectively.
12. Improving occupational concepts and skills through varied work experience--a necessity.
13. Broadening knowledge of all coordination programs.
14. Understanding of career development theories and practices.
15. Utilizing group instruction strategies.
16. Meaningful leadership training.
17. Competency in interpersonal relationships; coordinators of disadvantaged should be compassionate people who can accept the student at face value as a person; able to relate to size and problems of community (type of student, number of students, board policy, and money available).
18. Relating to employers.
19. Training in public relations; ideas on public relations of various districts; organizing banquets.
20. Knowledge of State Plan, forms, and D.O.T.
21. Personnel relations--administrative and business hiring procedures.
22. Formal education should include courses in guidance and counseling, evaluation techniques, adolescent psychology, techniques in coordination.
23. Updating the coop programs to current standards.
24. Placing handicapped students without jeopardizing the image of coop programs.
25. Developing training plans and contracts with employers.

---

*As identified by coop coordinators, consultants/specialists, teacher educators, and administrators.

26. Individualizing instruction based on training plan.
27. Improving student placement procedures.
28. Starting diversified coop programs.
29. Utilizing multi-media methods in related instruction.
30. Writing performance objectives and relating these to curriculum development and evaluation.
31. Clarifying the role of the coop coordinator.
32. Understanding of the theoretical role of cooperative work experience education.
33. Knowledge of community employers and the specific skills that are actually demanded.
34. Understanding the relationships of public school coop programs to other similar public service institutions in the communities, such as OEO, Department of Labor, and local employment groups.
35. All occupational teachers need training in coop coordination techniques.
36. Training in industrial psychology.

Competencies and Training Needs of Administrators/Supervisors/ Directors*

1. Selecting and implementing viable budgeting and accounting systems.
2. Gathering and reporting program and personnel data for local, state, and federal records.
3. Interpreting the State Plan administrative guide lines.
4. Communicating through the written word.
5. Briefings on legislative action.
6. Evaluating instruction.
7. Evaluating programs.
8. Providing leadership for active advisory committees.
9. Identifying specific needs of people.
10. Utilizing current manpower need trends and projections in program planning.
11. Sensitivity to skills currently being demanded and used in communities.
12. Understanding the changing world of work.
13. Managing by objectives.
14. Projecting annual and long range program plans.
15. Planning, selecting, and evaluating equipment and facilities.
16. Project planning and implementation.

---

*As identified by administrators, consultants/ specialists, and teacher educators.

17. Techniques for program planning, budgeting, developing, managing, and evaluating.
18. Working with groups.
19. Techniques in human relations.
20. Assisting leadership people from minority groups.
21. Supervisory and administrative technique.
22. Providing general leadership training for staff.
23. Working effectively with nondegree teachers.
24. Using cooperative education in subject areas other than distributive education.
25. Expanding familiarity with all occupational areas under supervision.
26. Affecting change through dealings with top administration.
27. Assisting general administration with understanding of vocational education.
28. Selling vocational-technical education to parents, counselors, administrators, and students. Relating the school to the community.
29. Keeping informed of emerging curriculum innovations.
30. Understanding the area vocational concept thoroughly.
31. Planning and implementing programs for handicapped and disadvantaged.
32. Understanding special problems involved in counseling vocational students.
33. Developing concepts and techniques in supervising instruction.
34. Designing instructional systems.
35. Individualizing instruction through application of various media forms.
36. Familiarity with management approaches to personnel development.
37. Conducting inservice personnel development programs.
38. Utilizing differentiated staffing patterns and making best use of paraprofessionals.

Competencies and Training Needs of Consultants/Specialists*

1. Orientating new personnel to State Department policies and procedures.
2. Clarifying roles and responsibilities of the Vocational Education and Career Development Services and other State Department divisions.
3. Becoming more familiar with the various services.

---

*As identified by consultants/specialists and teacher educators.

4. Clarifying the functions of consultants.
5. Planning and evaluating programs.
6. Long-range planning procedure.
7. Management by objectives.
8. Performing task analysis.
9. Using objectives and goals as a base of operation.
10. Develop competence in terms of relating goals and objectives to vocational programs, and develop ability to construct and evaluate performance objectives.
11. Writing performance objectives and relating these to curriculum development and evaluation.
12. Identifying specific programs for people.
13. Planning laboratory equipment in evaluating construction plans.
14. Developing of materials which will assist in the communication process when giving presentations.
15. Improving communications skills and developing communications theory concepts.
16. Planning conferences.
17. Training in school law and finance.
18. Writing proposals.
19. Keeping up on actual practices in business and industry.
20. Improving public relations strategies.
21. Techniques in helping teachers plan and teach. This includes a need for specialization as well as for generalization as regards occupations.

Competencies and Training Needs of Guidance and Placement Workers*

1. Using occupational information effectively.
2. Understanding the K-14 "world of work" concept.
3. Knowing career development for women.
4. Working more closely with business and industry.
5. Information on Project View and ECES of Flint to acquaint guidance counselors and placement directors with the possibilities of career exploration programs.
6. Utilizing community resources.
7. Retrieving and referring information on community resources.
8. Building broader, deeper, and more recent work experience backgrounds.
9. Strengthening interest in students' needs.

---

*As identified by administrators, consultants, and teacher educators.

10. Knowing the role of and opportunities available at area vocational centers.
11. Interpreting occupational aptitude tests.
12. Broader competencies so as to function in vocational education as well as in general education.

Competencies and Training Needs of Paraprofessionals*

1. Very basic methods and techniques for instructing individuals and small groups.
2. Understanding variations in student abilities and meeting special needs.
3. Handling various class situations.
4. Understanding the worth of all students.
5. Preparing instructional materials.
6. Using audio-visual equipment.

Competencies and Training Needs of Special Needs Workers**

1. Developing awareness of the specific needs of the handicapped and disadvantaged.
2. Knowing who the handicapped and disadvantaged are, how to plan programs for them, and how to accommodate them in regular programs.
3. Compassion for and understanding of individuals.
4. Knowing differences in teaching methods and materials for special needs students as compared to normal students.
5. Evaluating programs.
6. Adapting curricula to the open entry-open exit concept and the immediate feedback or reward concept.
7. Developing skills in human relations.
8. Handling potentially explosive urban situations.
9. Understanding of the drug problem, student dissent, and racial issues.

---

*As identified by administrators, consultants/specialists, and teacher educators.

**As identified by consultants, teacher educators, and administrators.

Competencies and Training Needs of Teacher Educators*

1. It seems imperative for teacher educators to remain in constant contact with public schools as well as with industry. It is recommended that individuals designated as vocational teacher educators be required to provide evidence of these types of activities.
2. First-hand knowledge of the specific job and skill requirements. Update practical work experience.
3. Understanding the basic preservice and inservice needs of teachers, general as well as vocational.
4. Knowledge about innovative developments in other vocational teacher education programs in the state as experienced across subject areas.
5. Awareness of other States' efforts to move ahead in vocational-technical education at all levels.
6. Ability to identify those competencies and performances required for classroom teaching and to distinguish those which are unique from those which are common.
7. Teacher educators in various fields need to emphasize commonalities.
8. Identifying professional competencies as well as trade competencies.
9. Preparing for across-the-board responsibility.
10. Developing new models for training.
11. Understanding management systems approach to education.
12. Helping teachers to work with special needs children.
13. Helping teachers work closely with people in the community.
14. Working with advisory committees.
15. Knowing how to establish information retrieval systems.
16. Establishing and evaluating behavioral objectives.
17. Conserving human resources through sharing and avoiding duplication of efforts.
18. Utilizing differentiated staffing in teacher education.
19. Need for teacher educators to become familiar and closely attuned to developments in secondary schools, area skill centers, and post-secondary programs.
20. Being familiar with the performance contracting and accountability movement.
21. Improving familiarity with industry, business, and community agencies.
22. Knowing federal and state legislative developments.

---

*As identified by teacher educators, consultants/specialists, and administrators/supervisors/directors.

23. Improving communications within the teacher education community.
24. Writing proposals.
25. Introduction to the importance of subject area youth organizations or clubs.
26. Understanding of across-the-board coop education.
27. Giving leadership in emerging areas, such as working with the disadvantaged and handicapped.
28. Relating with the disadvantaged.
29. Updating on new methods and techniques of teaching.
30. Utilizing paraprofessionals effectively.
31. Understanding community college purposes and objectives.
32. Increasing awareness of technical competency needs of community college instructors.
33. Competency in project and office labs.

Summary

The quantitative and qualitative requirements for vocational-technical education personnel have been identified in this Section. First, state and national personnel requirement projections were reviewed, followed by a brief review of the methodology commonly associated with making such projections. Second, the quantitative aspects of personnel demand were developed, based on the results of employer interviews, enrollment projections, and teacher/student ratios. The demand problem was defined by personnel types, employer types, and occupational fields. Third, the data on personnel supply presented in Section III were applied to the demand projections, thereby revealing points of possible undersupply and oversupply. Specializations were identified for which there is no apparent university output. Finally, the very important qualitative dimension of personnel requirements was presented by personnel-type categories. This information was gathered through several working conferences and individual interviews. Thus personnel development needs for Michigan have been identified. Alternative solutions and recommendations leading to the satisfaction of these needs are presented in the next Section.

SECTION V

ALTERNATIVES AND RECOMMENDATIONS

One official purpose of this study and report is to investigate alternatives and make recommendations which will assist in the creation of a comprehensive plan for coordinating the development of an adequate supply of vocational-technical education personnel for Michigan's schools. This goal is accomplished in this section. Little space will be given to developing the logic of the necessity for a state plan, since this need is the very reason for having had this study done. Let it be stated, however, that the expansions and changes caused by the vocational legislation of the 1960's and other developments in education and in society require the adoption of changed concepts of vocational-technical teacher education. Clearly, the days of "teacher training" have passed on, but some haven't yet heard of the funeral. Even today's concept of "teacher education" is no longer adequate in respect to breadth. Thought and action should be expanded to "personnel development," for this implies continuous upgrading of all types of personnel, ranging from professionals through paraprofessionals and inclusive of preservice and inservice elements.

Major Goals for a Plan

In developing a proposed model for a state plan, a number of functions should be enumerated, since they become the goals and guidelines for designing, operating, and evaluating the system. The following significant functions are offered for consideration:

1. To provide an adequate supply of qualified vocational-technical education personnel in terms of quantities and qualities needed for staffing the unique, expanding Michigan programs, both public and private.

2. To provide for continuous reappraisal and reprojection of the personnel development requirements of specific categories of personnel on a short- and long-range basis. The system should be particularly sensitive to newly emerging needs.

3. To furnish an easily accessible, accurate information system which covers quantities and qualities of existing personnel stocks. To project future preservice and inservice personnel outputs.

4. To furnish means for distinguishing between requirements which can be met through existing arrangements and those which necessitate new arrangements.

5. To provide for establishing priorities among personnel development requirements.

6. To provide for delineation of roles and responsibilities of teacher education institutions, State departments of education, professional organizations, and employing school districts or units in meeting personnel development requirements.

7. To involve a broad range of appropriate agencies, institutions, and individuals in the preservice and inservice delivery systems, and to provide for coordination of their activities.

8. To maximize the efficiency and effectiveness of all activities which comprise the delivery system.

9. To identify and utilize efficiently all possible dollar resources available to personnel development.

10. To provide for improved means of communication between all agencies, institutions, and individuals concerned with personnel development, so as to facilitate multidirectional exchanges of ideas and information.

11. To furnish links between local, state, and federal-level personnel development planning and activities.

12. To furnish guidelines for programming, implementing, and evaluating personnel development activities.

13. To identify specific programs and projects needed for meeting specific personnel development needs.

14. To make opportunities for preservice and inservice personnel development available throughout the state to the extent that resources will allow.

15. To provide for continuous, multi-level feedback and evaluation of the system, inclusive of goals, process, and product.

Variables to Be Recognized

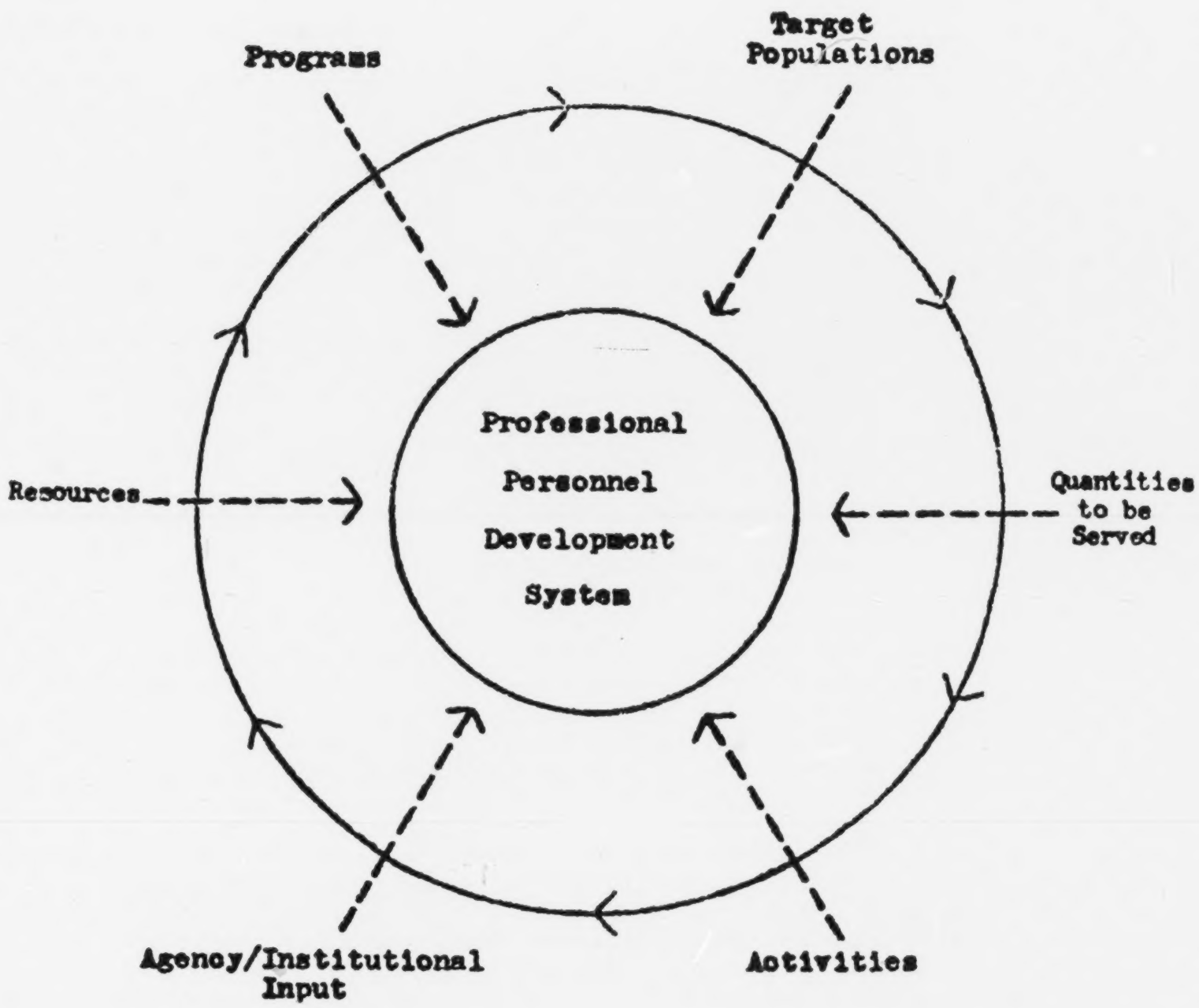
A number of major variables must be considered when planning a personnel development scheme. Parks (20) identified six of them and illustrated their relationships (Figure 13).

A. Program Variables - Vocational-technical education has long been known to provide preparatory and upgrading instruction across a wide spectrum of occupational areas. Although much time and effort has been directed toward identifying the common elements which are appropriate and applicable in the preparation of all vocational-technical professional personnel, the fact still remains that there exist some unique elements which are important in the preparation of selected professional personnel. A professional personnel development model must recognize such differences and provide for them.

B. Target Population Variables - Most programs which have addressed themselves to preparing vocational-technical professional personnel have focused primary attention upon the preparation of teachers without sufficient attention being directed toward providing programming specifically for supervisors, administrators, teacher educators and guidance personnel. If such programs were in existence, they were generally lacking in sufficient depth to adequately prepare personnel for such leadership roles. A comprehensive professional personnel development model must provide for a stratification of populations to be served, and plan objectively for each population grouping.

C. Quantities to be Served - . . . Any model for professional personnel development must possess the characteristic to adjust to ever-changing supply and demand factors. Such adjustment must be one of relative quickness in order to meet immediate and/or unanticipated emergencies or crises regarding the need for/of professional personnel.

FIGURE 13. VARIABLES OF A PROFESSIONAL DEVELOPMENT SYSTEM FOR VOCATIONAL EDUCATION



Source: (20).

D. Activity Variables - The nature of the professional personnel development activity relates specifically to whether such an activity is short-term, intermediate, or long-term. Such a variable(s) could also be illustrated as pre-service, in-service, or graduate programming. These variables reflect directly upon additional factors of consideration in their design and implementation, including the group to be served, the availability of input resources including staff, budget, facilities, and time of offering to mention a few. Any professional personnel development model must reflect sufficient flexibility and adaptability to adjust the activity variables as supporting factors change.

E. Resource Input Variables - Especially where a professional personnel development model for vocational-technical education is highly dependent upon the financial appropriations of state and federal agencies, such a model must not be so rigid that it cannot adjust to and fluctuate regarding financial resources. Such a model must be so designed. Other resource input variables include staff personnel, facilities, equipment and time.

F. Agency/Institutional Input Variables - Conflicting differences in philosophies and objectives on the part of cooperating agencies and institutions involved in the application of a professional personnel development model is also an important variable in the design of such a model. Such differences are most often apparent between state department agencies whose major responsibility involves the administration of vocational-technical education programs in a state and colleges and universities who have been assigned the responsibility for the development and training of vocational-technical professional personnel. Any such model design must recognize such differences, if in fact they do exist, and employ the necessary techniques to resolve or compromise them (20:9-12).

The latter variable needs to be clarified and underscored. It might be titled Delivery Entity or Agency Variables (training organizations). Delivery Entities are those agencies, institutions, businesses, industries, and individuals capable of providing courses, workshops, seminars, work experience, and the like for purposes of meeting professional development requirements. In addition to teacher education institutions, the State Vocational Education

Services, and local education authorities, there are numerous other alternative means available. These alternatives may be combined in various ways or used singly.

Design of a Plan

A model scheme for developing, operating, and revising the Michigan State Plan for vocational-technical education personnel development is now presented in schematic form. It accommodates the several functions or goals and the six variables outlined above. It is a recycling scheme capable of constant adaptation to changing requirements and delivery systems. The six parts of the schematic are amplified in brief outline form to provide additional detail about the proposed scheme.

Developing and Operating a State Plan for Vocational-Technical Education Personnel Development: Process Schematic and Content Model

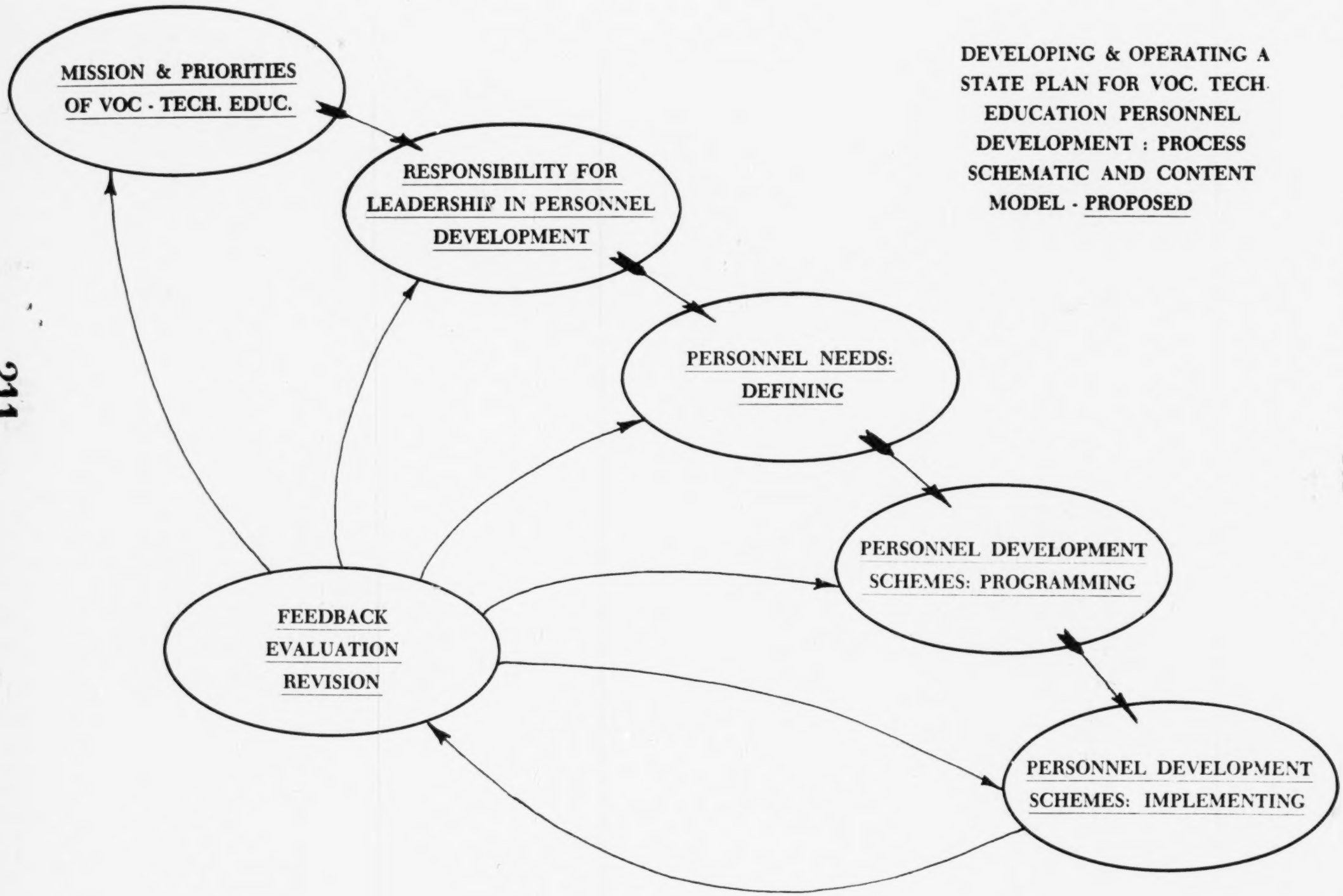
I. Mission and Priorities of Vocational-Technical Education

- A. Individual and societal needs
- B. Disadvantaged, handicapped, unemployed needs
- C. Special rural, urban, and suburban needs
- D. State of Michigan goals and priorities
- E. Federal priorities
- F. Unique local requirements
- G. Federal, state, and local goals and priorities merged
- H. Implications for personnel development requirements

II. Responsibility for Leadership in Vocational-Technical Education Personnel Development

- A. Locus of responsibility
  1. State Board of Education in cooperation with
  2. Teacher education institutions,
  3. Employing school units,
  4. Professional organizations,
  5. Other organizations (public and private), and
  6. Individual professionals and paraprofessionals.

DEVELOPING & OPERATING A STATE PLAN FOR VOC. TECH EDUCATION PERSONNEL DEVELOPMENT : PROCESS SCHEMATIC AND CONTENT MODEL - PROPOSED


MISSION & PRIORITIES OF VOC - TECH. EDUC.
RESPONSIBILITY FOR LEADERSHIP IN PERSONNEL DEVELOPMENT
PERSONNEL NEEDS: DEFINING
PERSONNEL DEVELOPMENT SCHEMES: PROGRAMMING
PERSONNEL DEVELOPMENT SCHEMES: IMPLEMENTING
FEEDBACK EVALUATION REVISION

B. Organization

1. Personnel Development Unit of State Vocational Education Services
2. Advisory body
3. Delivery Entities (training organizations)

III. Personnel Needs: Defining

A. Identification of vocational-technical programs and personnel types

1. Established
2. Emerging

B. Supply--Estimates of personnel available for employment

1. Existing stocks--quantities and qualities
2. Sources of supply
3. Preservice outputs
4. Inservice activities
5. Attrition rates

C. Demand--Quantitative and qualitative estimates of personnel requirements

1. By personnel type
2. By level of educational enterprise
3. By occupational field and specialization
4. By year needed
5. Special competency requirements

D. Personnel development objectives

1. Unmet needs--Quantities
2. Unmet needs--Qualities

IV. Personnel Development Schemes: Programming

A. Personnel objectives to be met through

1. Existing programs
2. Establishing new programs

B. Personnel development priorities

1. Time--Immediate and long range
2. Criteria--Local, state, and national goals

C. Personnel competencies to be developed--Performance objectives

D. Resource alternatives

1. Human
2. Financial
3. Physical plant
4. Time
5. Delivery entities (training organizations)

E. Alternative program vehicles

F. Program (project) selection

V. Personnel Development Schemes: Implementing

A. Agency, institution, contractor selection

1. Solicitation
2. Application
3. Review
4. Selection criteria

B. Contractual arrangements

C. Project (contract) monitoring

VI. Evaluation of Total Personnel Development Scheme

A. Feedback
B. Evaluation
C. Revision

Implementing a Plan

The many suggestions and recommendations to follow are intended to indicate some of the principles and actions which should be implemented if Michigan is to have a viable personnel development scheme. They are by no means inclusive of all possible considerations and alternatives, but they do cover points which seem to be particularly germane at this time. But first, an implementation procedure is suggested.

1. Establish a Personnel Development Unit in the State Vocational Education Services with full-time professional staff, including a coordinator and assistant, and spell out its functions.

2. Form an active advisory council with membership drawn from all entities concerned with personnel development, and list its duties.

3. Formalize a coordinating council of teacher education institution representatives, and enumerate its responsibilities.

4. Define personnel development needs (quantities and qualities) and translate them into quantities and performance objectives.

5. Develop and agree to plans for programming and implementing personnel development vehicles.

6. Evaluate and revise the system.

A Unique Michigan Plan

Michigan's personnel development plan for vocational-technical education should first and foremost be unique to and befitting the situation in this state. Having done this, it should then recognize federal needs and priorities since Michigan's personnel development plans are inextricably tied to those of the larger community of states. By no means, however, should it be specifically an Education Professions Development Act plan for Michigan, for such would be too narrow and in reverse order. It would be tantamount to putting the cart before the horse. Rather, it should be a Michigan plan which is conceived broadly enough to accommodate and utilize EPDA assistance, or that of almost any other public or private plan truly beamed at solving Michigan's personnel development problems.

As a matter of record, the Michigan Vocational Education and Career Development Services and the teacher education institution contact persons were already moving to establish a coordinated state plan for vocational-technical personnel development before the EPDA federal requirements for such a plan were introduced. The plan should take into account the personnel development needs of all areas of vocational-technical education, both public and private.

Priorities should be assigned in harmony with local, state, and national goals for vocational-technical education, along the lines reviewed in Section II. They should be consistent with the Michigan State Plan for Vocational Education (61). Highest priority should be assigned to the preparation of personnel to meet newly emerging and Special Needs requirements, to the correction

of existing shortages, and to the inservice development of present personnel. Attention should be directed to defining and developing the competencies needed, since personnel qualities are at least as important as quantitative considerations.

Responsibility for Personnel Development

The responsibility for vocational-technical personnel development must be shared by teacher education institutions, employers of professional personnel, the State Vocational Education and Career Development Services, professional organizations, and individual professionals themselves. Gone are the days when the ills of an inadequate supply of personnel could be laid at the door of teacher educators alone.

Although all of the entities just named share responsibility for preservice personnel development, the primary focus for implementation should be on teacher education institutions, with assistance from the others. As to inservice personnel development, the major responsibility should reside with school employers and individual professionals, with strong assistance from teacher education colleges and the State Office. Coordination plus long-range planning, promotion of financial resources, overall expediting and implementation and evaluation should be the responsibility of the central state agency, namely the State Vocational Education and Career Development Services. The onus of responsibility for leadership in this matter is now clearly on the State Vocational Education Services Office. Throughout the state, this viewpoint was encountered time and again, in interviews with all kinds and levels of personnel.

State Personnel Development Unit

A separate personnel development unit within the State Vocational Education and Career Development Services should be established and staffed immediately with an initial minimum of two full-time professionals. The separate unit is justified for a variety of reasons, not the least of which is the need for focusing responsibility for personnel development within the department. For many years personnel development has been the concern of every unit, but the responsibility of none! Thus leadership in this area has usually been neglected. The need has progressed far beyond the point of assigning personnel to this major responsibility on a part-time basis.

The new unit should have separate identity and visibility in the Vocational Services' organizational chart. It might be named the Personnel Development Unit. At best, it should be a fourth major unit reporting directly to the Director, since personnel development matters are common to all existing units, bar none. Therefore, the new unit should be completely free to respond to needs and concerns across the entire department. Alternately, it could be attached to the Career Development Program section as an independent unit. It does not seem appropriate to place it with the Research Coordination Unit; however, this unit should definitely be involved with some functions, as discussed later.

The State of Illinois, Division of Vocational and Technical Education, places considerable importance on personnel development to the extent that a separate Professional and Curriculum Develcpment Unit was created about two years ago and has been staffed with several full-time professionals. This emphasis has been rewarded with the development of an effective operational plan for coordinating the work of eight universities. Several other states have also established personnel development units, often with multiple staffing.

The major function of the Personnel Development Unit should be to establish and operate a coordinated state plan for personnel development, with the advice of those groups named in the recommendation on an advisory body. Its duties should be to perform short- and long-range planning, identify personnel groups needing training, define specific development needs of these groups, establish priorities, implement training vehicles, develop administrative guidelines, promote resources, monitor and evaluate product and process. For a comprehensive listing of responsibilities for a state Personnel Development Unit consult reports by Barlow (2:7-8) and Parks (20:16-21).

The Personnel Development Unit should not attempt to carry out training itself; rather it should arrange for others to perform the actual training function. The State Office should <u>not</u> directly employ a staff of itinerant teacher trainers as continues to be done in some states. Some suggest that Michigan should return to this plan in order to meet needs of inservice teachers which are not being serviced by activities of university teacher educators and local administrators. This suggestion probably emanates from those who have become exasperated with the situation. Rather than return to

this approach, the solution resides in coordinating the existing teacher education resources plus the infusion of additional monies, with some emphasis on contractual agreements. The role of the State Office should be one of coordinating, promoting, and stimulating arrangements with other agencies to accomplish this task, not to add itinerant teacher trainers to its staff.

The Personnel Development Unit should facilitate two-way communications with teacher education institutions, striving to keep all informed of federal, state, and local developments. One of the most serious long-standing deficiencies, from the viewpoint of teacher educators, has been the failure of the State Office regularly to communicate news of significant developments to teacher educators. News of developments in federal legislation, changes in policy guidelines, or federally sponsored conferences arriving in the State Office from Washington frequently stops right there. Consequently, teacher educators often remain uninformed unless they happen to have their own Washington pipelines. Similarly, information on pertinent developments at the state level are not systematically passed along. The primary cause of this condition has been failure to designate full-time responsibility and authority to a visible unit within the State Office for handling communications and other matters relative to personnel development.

Assistance and support with such ongoing matters as annual identification of personnel development requirements and system evaluation should be provided by the Research Coordinating Unit of the Research, Assessment, and Evaluation Services division. The RCU should also be regarded as an appropriate unit to provide "in-house," inservice training for vocational education staff in a number of areas, but with special attention to administrators and consultants in improving their all-important communication skills and in sharpening special competencies needed to become more effective in Special Needs programming. Other means are available for performing this inservice training function, no doubt, but the RCU could function well because it is organizationally detached from the Vocational Education and Career Development Services; yet it is close to the problems at hand and can provide realism and relevance.

Means are needed to bring focus to defining and meeting inservice personnel development needs at the local level. Neither the State Personnel Development Unit nor the teacher education institutions has the manpower to meet each requirement directly and unassisted.

The advantages of local personnel development consultants attached to local school districts, intermediate school districts, or community colleges, becomes increasingly clear, since these people can be more closely attuned to the needs of specific programs and personnel than can the "expert" from the outside. This local coordinator of personnel development would identify the needs and bring in the resources needed to service them.

But most local schools do not have a vocational administrator, let alone one with time to worry about personnel development. Furthermore, most individual school units are not sufficiently large to make group training feasible. Intermediate school districts with vocational consultants or administrators do, however, constitute viable units for organized personnel development activities. For example, Oakland Intermediate School District, with its staff of consultants, has made time for this function and has frequently delivered the goods itself. The new emphasis on shared-time vocational directors has the potential for providing similar results.

If the Michigan legislature determines that present intermediate school districts should be reduced in number to about twenty, a vocational education consultant should be attached to each one, with the stipulation that his primary task is to promote personnel development. Such enlarged intermediate school districts would embrace sufficient numbers of vocational education personnel as to make for viable training units. Intermediate school district consultants would identify needs and expedite training, thus providing an intermediate operational level between state and local units. Similar arrangements could be made on a regional basis to cover the requirements of community colleges. For a list of responsibilities for local personnel development consultants, check Barlow's report (2:8-10).

Personnel Development Advisory Group

A statewide advisory body on vocational-technical education personnel development should be established. Membership should be drawn from all major groups directly involved, including teacher education institutions, state vocational education office, employee professional organizations, and employers from both the public and private sectors. The latter group is meant to include employers of vocational-technical personnel in the public sector, such as community colleges, universities, area vocational

centers, local K-12 districts, intermediate school districts, the State Office, and other governmental agencies like MDTA, Job Corps, Corrections Department, and vocational rehabilitation. The private sector should include private trade schools and training programs in business and industry. The private sector should be included because (1) it has personnel needs similar to those of the public sector; (2) it often recruits from the same reservoir of preservice, inservice, and "out-of-service" personnel; and (3) it has much to contribute to the ways and means of personnel development. Such inclusion would tend to broaden the concept and results of professional personnel development in both sectors.

This advisory body should be organized and led by the State Office, and should be related to the Michigan Advisory Council for Vocational Education. Its functions should include assisting in determining a master state plan, defining personnel needs, identifying schemes for satisfying these needs, developing resources, and evaluating effectiveness. For a list of additional duties consult Parks' report (20:21-23).

Teacher Education Coordinating Council

The existing group of teacher education institution contact persons should be formalized and known as the Teacher Education Coordinating Council. Its responsibility should be to coordinate the personnel development activities of the member institutions. It should be co-chaired by the head State Office Personnel Development Unit consultant and one teacher educator elected by the Coordinating Council. The Council should meet regularly and be called together by the chairmen. Each institution should have one regular voting representative, appointed by the university president, and one alternate. The individual selected by each president should be in a position to represent common, across-the-board vocational-technical education resources of the institution, and have the authority to speak and act. It is also crucial that the person be one who is likely to be an effective communication link between the Coordinating Council and his colleagues in disseminating information and in gathering institutional inputs.

The institutional representative should have 50% of his time designated for the functions of the Coordinating Council and directly related activities at his home institution. Much time will be needed in the immediate future. One method for accomplishing this is

to furnish half the salary of each institutional representative from state personnel development funds, as is currently the case in Illinois. In addition, Illinois has submitted application for funds to employ leadership interns to work with each of eight institutional representatives. If this plan were to be used in Michigan, it would be necessary to guard against universities usurping the assigned time of both their institutional representative and intern with internal institutional assignments. Additional support funds would be needed for travel and communications.

Two persons selected by the Coordinating Council should be members of the larger Personnel Development Advisory Group, but should not be responsible to it.

University Organization for Vocational-Technical Personnel Development

Most teacher education institutions should reconsider their organizational patterns for improved effectiveness in terms of meeting the massive tasks before them. The basic patterns in effect late in 1970 were reviewed in Section III, but typically there are two models: (1) those in which the various departments are located in different colleges or schools and carry on their activities with separate lines of authority, budgets, faculty, and programs, but are held together with all-university vocational technical-teacher education coordinating councils; and (2) those in which all units are organized into a single unit, department, or division with common budget, faculty, etc.

Those with commitment to the former plan must develop their coordinating councils to improve communications, eliminate duplication, raise efficiency, and in general get the most mileage possible from limited resources. But it is also recommended that those schools consider alternatives open to them for gathering their units more closely together into some unitary organizational form. It is the business education departments in most universities which are separated organizationally from the others. Note should be taken of the Gordon and Howell, and Pierson reports which recommended that colleges of business drop business education or transfer it to colleges of education (10:245). A relatively satisfactory alternative arrangement utilized by some universities is the joint faculty appointment, through which teacher

education faculty can hold mutual appointments with both colleges concerned--the college or department of education and the college or department offering the subject matter major. This provides maintenance of valuable ties with the subject matter college, so often insisted upon by some faculty.

There is a decisive national trend toward unified vocational-technical teacher education services or departments, as well as toward adopting the broader concept of "personnel development" as is contrasted with "teacher education." A number of advantages should be emphasized as regards unified organizational forms.

1. Improved identity and visibility are provided for vocational-technical personnel development, both internally and externally.

2. Improvement of internal and external communication is more likely to occur.

3. A university administration desiring to see its vocational-technical personnel development unit move forward aggressively can designate responsibility, authority, resources, and accountability more directly.

4. Improved long-range planning should be possible.

5. Significant economies can be realized through elimination of overlapping courses and other activities. There are actually far more commonalities than unique components upon which to base personnel development programs, according to a report by Cotrell (5). Common core courses with student projects in their fields of specialization can save staff and dollar resources without jeopardizing relevance or quality of instruction.

6. Agricultural educators, business educators, home economics educators, industrial educators, etc., will tend to broaden their perspectives and become vocational or occupational educators. Associations and activities within a unified organization will tend to develop broad-gauged faculty, which is consistent with the thinking behind the vocational education acts of the 1960's.

7. Response to requests for services may be met efficiently and effectively through one channel. Many requests are for common vocational-technical services, and teams of faculty may be organized to respond. Some institutions are not effectively organized to cope with <u>total</u> occupational education personnel development needs.

8. Courses and other educational experiences in various aspects of professional vocational-technical education can be offered to general school administrators, curriculum consultants, counselors, etc., who need to know the field more broadly.

9. Badly needed new programs designed to meet emerging personnel needs, which typically cut across the separate occupational services, such as agri-business, should be more easily effected.

It is recognized that most of the above improvements may also be realized through continuation of the separate department organizational mode, but not likely as directly, efficiently, or completely as the unitary organization can provide. Field service and placement offices should be included in coordination council activities to improve an ongoing, two-way exchange of relevant information. Guidance services should also be included.

It seems logical that the persons who chair the university coordinating councils should also be appointed by their respective university presidents to be the institutional representative on the State Teacher Education Coordinating Council. This is recommended since improved communications should result. Also, institutions should consider the utilization of advisory committees of their own.

Program Authorization

Some comments are needed on the subject of program authorization, a function of the State Board of Education.

1. A procedure by which institutions gain approval of new preservice and inservice vocational-technical teacher education programs has been in effect for some time. Adherence to the procedure becomes increasingly necessary if the state is effectively to coordinate personnel development. All institutions should follow the same rules. If institutions decide to assert individual autonomy and proceed despite the presence of limited state controlling measures, the procedure becomes meaningless and the prospects for a coordinated state system are undermined. Voluntary subscription to an approval system is most desirable. On the other hand, some reasonable route of recourse is required, to avoid the possibility of stifling new and creative solutions to old and emerging needs, when the approval procedure results in rejecting a sound proposal.

2. There should be some means for regular follow-up to determine if approved plans are being executed as intended, with the possibility of review and withdrawal if they are not.

3. Clarification should be made as to whether program proposals for personnel other than teachers, and those for which there is no state certification, must follow the formal approval procedure. Obviously they should, if a coordinated state system is to be effective.

4. An effective program authorization scheme requires adequate state staffing in order to speed up approval and follow-up procedures. The assistance of an advisory body would be desirable.

It would seem best to provide vocational-technical education personnel development curricula in the common occupational services on a regional basis to meet pre-service and inservice requirements through on-campus and field service extension of the several state institutions. Since most institutions have staffed for business, home economics, and industrial teacher education, Michigan is not likely to shift toward establishing one specialized institution in each of these fields, as is the plan in some other states, nor should it do so. Fewer persons than in the past make fixed career decisions before entering college. Hence numerous individuals have entered vocational and practical or applied arts teaching as the result of decisions made after college entrance, since the opportunity was available to them at the same location. Similarly, local residents can reach for a broader range of career choices, without having to uproot families and move away to specialized institutions, something they are unlikely to do unless highly motivated. Consequently, the availability of these options locally tends to improve the supply of personnel. Also, this range of services should be available regionally, on and off campus, to meet inservice personnel development requirements.

It is recognized that specialized institutions can provide a greater depth of competency, and they may make more efficient use of resources. But economies may be realized with the regional institution plan if commonalities are emphasized. Somewhere along the line, however, some authority must decide whether to continue to authorize nearly all institutions in each subject area or to limit the designations, thus developing specialized institutions.

There remains the problem of designations in health occupations personnel development. Although health occupations teacher education should be available throughout the state, not all institutions have the intrainstitutional capacity in the various health specialties to support complete on-campus programs. Thus designations would need to be made with care to insure coverage of the various specialties and regional availability, and these might be attained without designating every institution. This approach might not be entirely consistent with the prior principle which would urge the provision of broadly based personnel development programs in all state institutions on a regional basis, since some institutions might be left out. Another alternative plan exists, however, through which universities would provide only the professional education component (plus general education and perhaps the minor), building on major and minor equivalencies developed or being developed elsewhere, i.e., community colleges, work experience, etc. Thus institutions could accommodate health, as well as other occupational fields and specializations as they emerge, with minimum outlay for staff and facilities. But again stress is laid on the need for capitalizing on commonalities in university delivery systems.

In addition to institutions providing broad regional services, some should develop capabilities for meeting unique, distinctive, or highly specialized needs which require unusual staffing and delivery systems; requirements for which the quantitative demand may tend to be small and/or the duration of need may be relatively temporary. It is not feasible for all or most institutions to engage in these activities; yet these services should be available on a statewide basis. Designations and resources should be made available to build specialized personnel development schemes in such fields as paraprofessionals, vocational guidance, disadvantaged, handicapped, migrants, etc. Utilization of consortium arrangements to pool human and physical resources should be encouraged. Genuine, long-term commitment and support are demanded from the institution and the state if sound results are to be expected.

With three universities already offering doctoral programs, further investment of resources in additional programs at other institutions seems highly questionable. Masters degree programs are warranted on a regional basis, to serve local inservice personnel who normally proceed to this level in connection with continuing certification. Addition of specialist programs at the former state colleges of education, now regarded as regional

universities, should be approached with caution because of the additional resources usually required, added burden to existing faculties, the small numbers involved, and the relationship with existing doctoral programs elsewhere. Graduate degree programs for community college employment are generally lacking and should be made available.

Contracting

It is recommended that contracting be utilized both as a supplementary and primary means for personnel development. With the resources presently available to them, large portions of the continuing personnel development requirements are being met by teacher education institutions, State Office personnel, school employers, and professional organizations. To bridge the gap between the ongoing level of activities and the real personnel development requirements, additional resources must be pumped in. Much of this should be accomplished by adding funds to existing organizations, but a large share of the needs would be best serviced on a contractual basis. Examples of these needs are those which tend to be short term, highly specialized, sometimes of a remedial nature, and those which are outside the existing capabilities of teacher education institutions. Special and emerging needs are often best handled in an ad hoc manner outside the existing system by contracting with whomever or whatever entity can best deliver the results. On the other hand, continuing, recurring needs should be serviced, whenever feasible, on a regularized basis by existing organizations.

Contracting should be possible in connection with all types of vocational-technical education personnel requirements. A wide variety of contracting entities should be considered eligible for this service. Other governmental agencies should be considered, in addition to teacher education institutions. Private sector training programs; proprietary vocational and professional schools, including correspondence schools; and private or individual consultants with special expertise in particular specialties should be eligible. A more complete review of these alternatives was presented in Section IV.

The State Personnel Development Unit should handle contracting and select appropriate contractors for specific tasks, using criteria which should include, among others, ability to deliver the goods with lasting results. Performance contracting should be utilized whenever appropriate, but guaranteed performance contracting should await improved precision in evaluating outcomes.

Although the Personnel Development Unit should seek out and select contractors to service specific needs, there should always be an open channel for local school units and teacher education institutions to initiate or propose personnel development tasks that they wish to undertake. In other words, initiation should not always come from the state, but from the field too, thus establishing a two-way corridor.

Since nonuniversity contractors are unable to award university credits for those who need or want them, the Teacher Education Coordinating Council should be consulted to determine the extent to which completion might be recognized and applied toward certification upgrading and university degrees.

It is important that proposals be reviewed by a group of readers, not by a single individual. These readers should be impartial, be well informed on ends and means, and be representative of various interests involved.

Resources for Personnel Development

An important function of the new Personnel Development Unit should be to seek to increase existing resources and to cultivate new funds and services from private and public sources. To assure maximum impact in terms of priorities, expenditures from state and federal funds for personnel development should be coordinated by the Personnel Development Unit. Every possible source of funds from general and categorical budgets should be tested for utilization (see paragraph on Resources at end of Section III).

When the present vocational-technical teacher reimbursement plan is replaced with another way of allocating the same monies for encouraging program development in priority areas, a sizable portion should be directed to companion personnel development schemes. It is impossible to develop priority programs without at the same time (or before) developing the professional staff to carry the ball. Priority programs can be no better than the staff which operates them.

Annual and Long-Range Personnel Development Planning

An annual reappraisal of the long-range personnel development requirements should be conducted by the Personnel Development Unit, with assistance from the Research Coordinating Unit. A regularized system should be established to draw information from public and private school employers as to their requirements, universities as to their preservice outputs and inservice activities, State Office current personnel data bank, State Vocational Office Annual and Long-Range Program Plan, and State Higher Education Services post-secondary program planning data. This system should be conducted on a common, across-the-board basis, inclusive of all occupational fields, personnel types, and employees.

In its present form, the Annual and Long-Range Program and the enrollment survey conducted by the State Vocational Education and Career Development Services is a valuable tool for anticipating future personnel requirements, but it should be expanded to collect data on specific additional staff needs, including paraprofessionals. As it stands, personnel requirements must be extrapolated from data on enrollment and program additions. The Survey does not show the extent to which schools already have the personnel capabilities on hand to meet future needs.

Emphasis on Qualities and Competencies Needed

Concern about satisfying the quantitative needs should not overshadow emphasis on the qualities and competencies needed in an adequate supply of personnel. Attention should be directed to periodic reappraisal of the competencies needed. The qualities and competencies judged important should be identified by the personnel groups themselves, as well as by those who work with them, as was done in developing the listings contained in the final portion of Section IV. The listings should be converted into statements of behavioral objectives, and priority groupings assigned to them. Competency identification and conversion into behavioral objectives is a prime example of a task which should be contracted with universities or other agencies. Competencies thus defined should be the basis for curriculum and course development.

Personnel Data Bank

A centralized, computerized vocational-technical personnel data bank should be established, covering all types of inservice personnel. It should be accessible to those involved in planning and operating personnel development schemes, to administrators recruiting staff, and to professional organizations. Personnel development planners should have "instant" access to the current stocks of specific types of personnel. Teacher educators should be able to draw computer printouts of their graduates for follow-up purposes. Employers should have access to printouts regarding the kinds of personnel for whom they are searching, including new graduates, inservice personnel, and those temporarily "out of service."

The data bank should be inclusive of all types of certification, both general practical arts and vocational; university outputs of newly certified personnel; majors and minors; occupational specializations; age; location; name; sex; institution making recommendation; certificate expiration date; etc. Personnel who leave the service should not be removed completely from the file, but transferred to an inactive section since they constitute a reserve personnel pool from which some might be recruited at a later time.

This data bank should be maintained jointly by the State Teacher Education Services and the State Vocational Education and Career Development Services, with initiative from the Personnel Development Unit of the latter. It should be noted that most of the ingredients necessary to make this recommendation operative are already in existence for secondary-level personnel. Some data are contained in the vocational certification records, some in the general certification records, and some in the annual K-12 professional personnel register. Integration and further refinement of these sources would provide an unusually comprehensive and useful data bank of the current stocks of professional personnel in Michigan.

As it presently stands, post-secondary personnel are not included in this system unless they hold secondary certification, since the post-secondary vocational teacher authorization procedure is being eliminated. No post-secondary personnel data collection system was discovered to parallel the annual K-12 Register of Professional Personnel. It would be desirable, even necessary, to include the post-secondary personnel, to have basic data for projecting future personnel needs. Because of the void in this area, a special survey of personnel

characteristics had to be performed for this report. These activities must be coordinated with the State Higher Education Planning and Coordination Services.

An expansion of the annual K-12 Register of Professional Personnel survey conducted by the State Teacher Education Services should include data on positions which were unfilled by regularly certified persons when school opened. A significant contribution could be made by keeping tabs on the personnel requirements situation each year in all secondary teaching fields, general and vocational, regarding (1) the positions by subject which went unfilled in September, (2) reasons why they were not filled, and (3) positions which were filled with temporary personnel.

Other refinements would make the Register more useful to planners in secondary-level vocational education. The major subject category presently named "Industrial Arts and Industrial Education" should be changed to "Industrial Education," and the subcategories within revised to reflect more useful classifications. There is no direct way to distinguish vocational industrial teachers from the industrial arts certificate holders; therefore the existing certifications categories used in the survey form should be expanded to include a checklist of the vocational certificate types. Also, a category for Health Occupations should be established to distinguish these personnel from Health and Physical Education personnel.

University Output and Activity Records

It is recommended that the State Vocational Education Services and the Teacher Education Coordination Council meet to work out desirable data reporting procedures and content relative to outputs, faculty, and activities. The data on personnel outputs supplied to the state in recent years on USOE forms by some of the teacher education departments were found to be inaccurate and inconsistent to the point of being useless for purposes of this study. University reporting on outputs and activities is sorely in need of overhauling. These data are essential for local, state, and national personnel planning. One cause of difficulty was reported to be inadequate guidelines, as well as changes in the data sought from year to year without advance knowledge, thus making it difficult to comply promptly with accuracy. Many departments were hard pressed to furnish the kinds of

basic planning data requested in the course of this study. Some had little readily available data on past outputs, current numbers of majors, minors, and specializations. This should cause internal examination of institutional data-gathering procedures and some realignments. With agreements on data needed, reporting procedures, and an adequate time lead, it should be possible for institutions to cooperate without undue hardship on faculty time. It is recommended that the same output data sought in this study be collected annually. It is further recommended that each vocational certificate recommended be channeled internally, or at least copied internally, by letter through the same office as general elementary and secondary certificate recommendations. Some university registrars have no (or incomplete) records of vocational certification recommendations made by departments in their institutions to the State Department of Education.

Record of Emigration and Immigration

The method of recording teaching certificates issued by the State Department of Education to immigrants should be modified to include a head count by major field. Such data are significant for planners of personnel development requirements and are particularly important at this time, when general and vocational certification operations are being merged. Collection of emigration data seems to be reasonably useful within the annual NEA teacher supply-and-demand study program, but needs additional specificity in terms of distinguishing those with vocational credentials from those without. New university graduates could assist by promptly and conscientiously informing their placement directors when employment is secured. University teacher education departments, many of which have almost complete knowledge of their placements, should share their data with their placement offices. Some university departments, however, have dismal placement knowledge of their recent outputs.

USOE Occupational Classification Code

It is recommended that those involved with personnel development and utilization, especially teacher educators, employers, and the State Department of Education, make increasing use of the USOE occupational classification code (80) when specifying specializations, majors, and minors, and for purposes of describing curricula, courses, outputs, and job descriptions. Although the USOE code is not perfect, its utilization as a taxonomy would be useful in many ways, including personnel development planning.

Certification

One of the original charges set for this study by its sponsors was ". . . to develop recommendations for certification requirements and procedures for qualifying vocational and technical teachers. . . ." Since then, major strides have been taken by the State Vocational Education Services to provide a thoroughly revised vocational teacher certification code. Although most of the old ills will be remedied when the revision is installed, thus reducing significantly the size of the above charge, there are certain recommendations which still need to be made.

1. As soon as it is feasible, emphasis on certification should be shifted from a quantification of course work and years of work experience base to a demonstrated competency base, but not to the elimination of consideration of work experience. This is a tall order, and ideally it applies equally to all elementary and secondary certification, but it may be somewhat more feasible in vocational certification. Demonstrated competency would be especially useful in connection with unusual vocational specialties not normally offered at teacher education colleges. A given number of years work experience seems to be pertinent, but, in itself, is not a sufficient indicator of competency. Competency examinations should be included, too, except in the case of occupational licenses which were gained via examination. Written, oral, and performance components should be developed for shared use by all teacher education departments.

It is recognized that to actuate this plan would require a considerable increase in resources, and implementation is further complicated by numerous other problems. Nevertheless, demonstrated competency as the base for vocational teacher certification should be seriously considered as a future goal.

2. The Annual Authorization Certification category should be strengthened by adding a professional development requirement to the code as a prerequisite for renewal. No progress of any sort toward regular certification is required in its present form. Furthermore, an Annual Authorization holder cannot be bumped from his job by the availability of a fully qualified vocational teacher, as was so in the outgoing certification rules. Thus it is possible for these persons to continue from year to year without making a move toward professional improvement. Granted this category is needed in order to staff courses for which regular certificate holders are unavailable, and good quality

teachers who enter through this portal should warrant some protection, but only if they are making regular progress in improving their competencies as professional teachers. It is inconceivable that this situation can be allowed to stand if certification is to mean anything and if anyone is really serious about vocational teaching becoming a profession. Why should a person who is interested in becoming a vocational teacher bother with regular qualifications, so long as the Annual Authorization gate as it stands can be used and abused? In summary, let these persons in due to necessity, but require of them regular professional growth and development to remain in the service.

3. Vocational certification should be regarded as permanent only upon presentation of evidence of continuing professional development activities in both professional education and/or the occupational specialty. The continuing certificate should have a terminal date of about six to eight years, at which time it could be renewed for another period upon completion of additional professional development activities. To award continuing (permanent) certification after three years of teaching, with no continuing professional development requirement, is to encourage obsolescence by default. Professional development should be broadly conceived to include credit and non-credit courses, work experience, and the like. The same principle of continuous professional development activities should be required of other types of personnel, including administrators and teacher educators.

4. There should be an effective preservice teacher education scheme for the new full-time "Temporary Authorization" and "Annual Authorization" personnel, somewhat like the schemes used in some other states. The plan works like this: Regional preservice courses of three to four weeks duration are held during August to provide initial instruction in pedagogy. Some school districts, especially new area vocational centers and some intermediate school districts, would be large enough to have their own courses. New personnel without teacher training are encouraged or required to attend. The courses need not be organized around separate occupational fields, but ought to be held regionally on an across-the-board basis, since most of the course content is common to all subject fields. Attention to specialized subject field needs may be provided through student application to their own fields, and through the use of teams of specialists at certain points in the courses. These preservice courses are followed up during the school year with regular inservice sessions and visitations.

Responsibility for conducting these preservice and inservice activities could be assumed by teacher education institutions on a regional basis, with financial support through contracts in cooperation with the State Professional Development Unit.

Meeting the professional education needs of these personnel through this plan would suggest certification rules which make participation mandatory. Although a voluntary footing would be more desirable in most respects, mandatory attendance should be considered so as to include the entire clientele.

5. Teacher education institutions should prepare themselves for the increased inservice professional development requirements spelled out by the pending new code. These include more credit hours and planned programs, both of which will demand more faculty hours in the classroom and in advisement. If the rules are revised to include an inservice requirement for the Annual Authorization category, then special provisions must be made to accommodate persons without degrees.

Alternative Routes to Vocational-Technical Teaching

The importance of providing numerous pathways for entry into vocational-technical teaching and for upgrading after entry must be stressed. Basically, these can be classified as inservice and preservice routes. Refer to Section III for a review of principal sources and routes. Occasionally, shortages of qualified personnel in various categories and teaching specialties require numerous routes in order to secure individuals to fill the positions.

Preservice Programs

The community college student is an excellent source of input for preservice teacher education programs; therefore this reservoir should be cultivated. The facts and recommendations presented by Feirer and Lindbeck in their study of the cooperative roles of community colleges and senior institutions regarding preservice industrial-technical teacher education schemes should be carefully studied and applied to the preparation of all vocational-technical teachers (31). They outlined two basic arrangements, named pyramid and partnership programs. Cooperative arrangements with community colleges constitute one

of the very best means to prepare fully qualified personnel in shortage specialties, for example, the health related occupations and some industrial-technical specialties.

Existing university students in nonpreference curricula should be cultivated as a source of preservice inputs. At some institutions this represents a surprisingly large proportion of current enrollments. Career choice patterns of college youth have altered toward delayed decision making and more frequent changes in goals. Often these persons are in their second year, and when seeking to define a professional goal, discover vocational and practical or applied arts teaching to be an alternative open to them. Knowledge of the availability of this alternative is not always accidental, and can be promoted by publicity activities through campus career guidance centers and dormitory resident advisors.

A closely allied teacher source is the upper classman and/or recent graduate of related departments who could be interested in vocational-technical teaching if the opportunities are made known to them and if preparatory avenues are provided. Examples include business administration, conservation and natural resources, engineering, nursing, hotel and restaurant management, and police administration.

Preservice undergraduate curricula should provide (1) general education, (2) general professional education, (3) specialized professional vocational-technical education, (4) free electives, and (5) occupational major and minor components. Regarding the latter and the degree of occupational specialization that should be available at each institution, it is suggested that specificity at least to the "cluster" or "galaxie" level be provided. To this should be added opportunity to concentrate in one subspecialty. It is impossible, however, to provide for all subspecialties with full slates of campus based courses at each institution. To solve this dilemma at least two alternatives should be considered. One approach would be the agreed assignment of subspecialties to various sister institutions and then sending students there late in the curriculum for that portion of their total program. This could be called a "common market" arrangement. It is essential that means for providing preservice specializations be actively developed and coordinated by the Teacher Education Coordinating Council and the State Personnel Development Unit. The other avenue would be to provide subject-matter competency through prior and/or concurrent work experience, independent study, arrangements with

community colleges, and training acquired through other entities in the public and private sectors. Thus the plan outlined in the previous paragraph entitled "Program Authorization," which would recognize for college credit at least in part the major and minor equivalencies developed elsewhere, is recommended again as a means for providing specialties. Evans provided a valuable classification of preservice teacher education routes in his new book (10:249-253).

Other alternatives should be accessible. A full-time course for degree holders without teacher education, similar to the pattern used in Britain, should be more readily available. This amounts to layering on up to an additional year of studies and student teaching to the first degree to gain a full teaching credential. The Master of Arts in Teaching found at Wayne State University and elsewhere is illustrative. This alternative for a full year or more of professional studies should also be available to nondegree holders. Canada is reported to be using this system, and offers a healthy stipend to induce skilled workers and technicians to become teachers (10:253). It seems that this plan should be applied to the problem of shortages in many specialized fields. Stipends plus other inducements should be awarded to those who would prepare in high-priority specializations. Financial aid loans could be geared to subsequent service as a teacher. In other words, for each year of financial assistance during preservice preparation, a year of service in teaching would be performed, thus retiring the loan in yearly steps.

Nothing less than a preschool or pre-employment preservice short course in teaching should be available for full-time prospective teachers who have not had such instruction. This should mark the commencing of a series of courses to be accomplished during the first year or so as an inservice teacher. Renewal of temporary teaching credentials should be contingent on completion of this series of courses. There should be opportunity to complete the above requirements by competency examination, for those who show promise of being able to do so.

Inservice Programs

Careful systematic planning must be applied to inservice personnel development by all concerned, since it has been, without a doubt, the most neglected phase.

Primary responsibility for inservice development programs should be with the employers and individuals themselves, with strong support from teacher education institutions and the State Office. Unhappily, local administrators are finding themselves increasingly unable to give attention to the personnel development needs of their faculties, due to lack of resources and increased pressure from more immediate problems. Therefore, increased assistance is in order from the State Office in the form of consultants and funds to support training proposals, and from teacher education institutions in form of services.

It should be pointed out that many of the local administrators and consultants who take their personnel development responsibilities seriously have reached a point of disillusionment and nonconfidence in the ability of teacher education institutions to meet their inservice personnel development needs. Most are ready to turn to other delivery entities, private and public, which are capable of supplying the desired services. Many would do so but for the inability of these other entities to furnish the university credits required by most local reward systems (also financial constraints). Private business and industrial training units are, in fact, already moving into this void with increasing interest. It is not straying very far from the truth to assume that possession of the almighty university credit is the main thread which keeps teacher education institutions in the inservice arena.

Universities must find the disposition and the resources to work directly with nondegree and/or non-teacher education, full- and part-time personnel, as well as degree teachers who have not had teacher education. Credit and noncredit, undergraduate and graduate, on-campus and off-campus, group and individualized instruction alternatives should be available, instead of what has seemed by some to be disregard for or inability to serve these persons. To meet these needs, university personnel must be able to take their services into the field where the personnel are, and be able to offer assistance in uncommon forms (like short, intensive courses) and at inconvenient times (such as August).

University resources have been far from sufficient to meet all requests, and university services recently have undergone further curtailment to the point of tending to eliminate all small classes and to reduce field services. It is at this point that inservice vocational teacher education is particularly vulnerable. Small classes produce red ink and few student credit hours, which is a serious handicap in the numbers game played for resources on university campuses. Therefore

contracts and subventions from state and federal personnel development funds increasingly are needed, in order to maintain existing levels of inservice courses and to expand offerings, particularly in the field.

Specific forms and directions which inservice instruction ought to take include:

1. Individualized programmed instruction courses, so that individuals may proceed at their own speed with teacher education courses. Computer-assisted instruction and audio-visual tutorial instruction should be utilized. This would help provide for the open-entry open-exit principle, would accommodate personnel starting service at any time of the year, and would make instruction available in remote locations.

2. "High intensity," drive-in weekend workshops, seminars, and meetings which would commence on Friday and continue through mid-afternoon on Saturday. This would allow coverage of areas with radii of many miles, and be particularly appropriate for courses in which a campus facility is important.

3. First-year teacher follow-up programs. First-year teacher follow-up programs, as initiated and developed by agricultural education faculties and consisting of classroom visits and seminars, have much to offer and should be utilized in all fields. Unfortunately, these programs can be costly in expenditure of human and dollar resources, but the returns are regarded as being so great as to make the allocation worthwhile.

4. More extensive field service offerings. University faculties must be able to move to where groups of students are located, rather than expect them to come to campus for all courses. Yet new constraints are being experienced at some institutions, which drastically reduce field services and thus restrict offerings to campus locations. This is exactly 180° off true course.

In general, universities should at least attempt to service the personnel development needs of a general, common nature in their immediate regions. The setting of common, across-the-board occupational education courses for professional personnel from all vocational fields is usually far more viable financially, due to larger enrollments, than courses set up along specific occupational fields. Thus a course named Evaluation in Occupational Education is apt to be more viable than separate courses in evaluation for industrial education or

health occupations. Therefore, institutions should offer more field courses of this type.

Institutions with resources and capabilities for meeting unique needs which cannot be serviced by other institutions should make them available where needed throughout the state. For example, providing personnel development services for doctoral studies, researchers, migrant programs, paraprofessionals, or human relations should not be met by all institutions. Thus an institution should be able to offer common occupational education services in its area, plus be able to develop unique services for the state at large.

5. Teams of teacher educators from an institution, or a consortium of universities, serving the inservice needs of area centers, community colleges, intermediate school districts, K-12 school districts on a contractual basis. The three week August workshop which the new Kent Skills Center offered for its new faculty, with assistance from three universities, is illustrative of the direction which should be taken. These services should have an initial preschool concentrated period of instruction, plus a continuing program throughout the ensuing year. Many more area centers will be opened throughout the state in the 1970's, and each one will have initial and long-range personnel development requirements. School units should set budgets for inservice education and the state should supplement these funds.

It is indeed unfortunate that the 1968 proposal by seven southeastern Michigan community colleges and two universities for a pilot inservice institute to improve teaching competencies of part-time novice occupational instructors was never funded. The needs of part-time instructors are critical in terms of instructional quality and staff morale. This proposal, or something similar, should be reactivated for immediate, high-priority attention. Other proposals and contracts should be entertained to get at the needs of part-time instructors in other types of institutions, including other public agencies.

6. Inservice programs for full-time personnel recruited from business and industry which upgrade them to full qualifications, including the baccalaureate degree and continuing certification. Since there is little or no preservice supply available to fill many specialized vocational-technical teaching positions at all levels, employers must continue to recruit from business and industry, plug them into teaching jobs, and try to make them into teachers. But some recruits cannot

qualify for admission to regular inservice graduate studies and some only possess high school diplomas. Functioning schemes for meeting the immediate and long-range professional needs of these persons are long overdue. Teacher education institutions with capacity to offer field services and common, across-the-board programs with emphasis on commonalities, should tackle this high priority requirement.

7. Increased availability of opportunity for inservice personnel continually to improve their specialized occupational competencies. The accessibility of various means for continual improvement of occupational competencies should be improved. Courses, conferences, and work experiences constitute major vehicles. University subject matter and technical courses are often inaccessible, since they are offered during daytime hours. Community colleges, which tend to have more evening courses and are often more accessible geographically, offer advantages worth considering. Inservice vocational-technical personnel without the baccalaureate degree would find this avenue useful, as would degree holders who are not concerned with graduate credits. Training opportunities in business and industry need publicity, and are discussed subsequently.

Teachers, cooperative coordinators, and guidance workers should be encouraged to return to business and industry for periodic work experience, in order to update their competencies and perspectives, with or without university involvement. Some universities have the means for coordinating and crediting these activities. More should do so, since it should be one way for upgrading certification. Local teacher contracts should provide for this very legitimate mode of professional development.

Recruiting Former Military Personnel

Michigan should take initiative in recruiting former military personnel, who have the needed occupational specialties by virtue of military training schools and service experience. Only 1.5% of the personnel who responded to our survey had been recruited upon leaving the military, which indicates this resource is not being tapped to the extent possible. Others, however, have gone to teacher education colleges first, using GI Bill support to gain degrees and teaching certificates before entering vocational teaching. Perhaps efforts should be made on a national basis, through the teacher education section of the AVA, to reach more personnel being separated from service.

Reciprocity Between Universities

Arrangements should be made to smooth out recognition and transfer of credits from one university to another. Since all universities offer some unique or distinctive features, it should be possible for individuals to have access to those services pertinent to their needs and to transfer the credits earned elsewhere without difficulty or penalty. A problem arises when a like course is not listed on the books of the recipient university. In this situation there should be sufficient flexibility to allow credit under a "general" credit heading. Some professionals in the schools express impatience with what they indicate to be almost a calloused disregard on the part of some institutions for the value of university credits completed elsewhere. This is a logical problem for the Teacher Education Coordinating Council to solve.

Directory of Training Opportunities in the Private Sector

A catalogue with a list and brief descriptions of the training opportunities available in the private sector, including proprietary schools, should be developed, periodically revised, and distributed to the secondary and post-secondary school units, state and intermediate school district consultants, professional organizations, and teacher education institutions. These training programs are often the best means for inservice upgrading in technical fields, but are largely unknown to most local administrators and their teaching staffs. Similarly, they provide important supplementary experiences for preservice personnel development. Numerous opportunities are available for other types of vocational-technical personnel, particularly for those in management, supervision, and coordination.

Responsibility for seeing that this service is provided should be that of the State Personnel Development Unit, and it might best be accomplished through a continuing contract with a teacher education institution. This function should actually be provided on a regional basis with USOE sponsorship, since a more comprehensive directory of training opportunities requires a regional approach.

Incentives

Improved incentive plans designed to encourage continuous professional development should be actuated by employers and subsidized with local, state, federal, and private resources. A state certification code which requires continuous professional development activity for renewal of all certificate types would be a step in the right direction. Immediate recognition of completed credit courses is needed, in terms of upward salary adjustments. Completed relevant noncredit courses and supervised work experience should be recognized on the same basis; otherwise vocational-technical personnel will continue to be forced to bypass what are often the most relevant development activities available to them. Promotion from within plus other incentives such as paid released time, reimbursed travel and living expenses, and tuition refunds should be more widely practiced.

The twelve-month contract, such as that used by Lansing Community College, which includes paid time for professional development activities (as well as paid vacations), should be perfected and encouraged for adoption elsewhere. The usual objection to this plan is that the added cost differential between ten- and twelve-month contracts is too expensive. However, the traditional vocational teacher partial salary reimbursement from state funds, which is reported to be scheduled for elimination next year, would go a long way toward covering the needed differences. It can be argued that these funds were intended for teacher upgrading, at least in part; therefore they should be used to support the twelve-month contract, provided, of course, that upgrading activities are a scheduled part of the contract.

Recent discussion in the State Vocational Education Services centered upon the desirability and feasibility of using vocational monies to pay for places at private vocational schools for some vocational students. Application of the same principle to teacher education needs would lead to using personnel development funds to subsidize teacher expenses in courses offered by the private sector.

Emphasize Commonalities

The professional education element of preservice and inservice instructional programs should increase emphasis on common elements or competencies, so as to develop vocational-technical or occupational educators, rather than industrial teachers or distributive teachers, etc. A study by a team of researchers under the leadership of Cotrell at the Ohio State University Center for Vocational-Technical Education reported that about 90% of the nearly 400 teacher competencies they identified were held in common by all vocational teachers, and that only about 10% could be regarded as being unique to any specific occupational field (5). This means that economies in vocational-technical teacher education personnel utilization may be realized, since duplication may be reduced markedly. Perhaps emphasis on commonalities may have the added benefit of tending to keep vocational-technical personnel development in the mainstream of American teacher education.

Overemphasis of the common elements approach to the elimination of attention to the unique features of teaching each subject field would be a serious mistake, however. A weakness in the common elements approach is that it tends to assume that application or transfer to problems of teaching in the individual's special area will somehow be made by the individual. To resolve this, a number of alternatives are available, including team teaching with common sessions and specialized interest sessions, student projects in specialized fields, etc.

Threaded through all programs should be common threads of goals, content, and process. Certain benefits can be gained by building in common elements which span all occupational programs offered by an institution. Cooperative work experience, student teaching, and foundations of vocational education could be operated on an integrated basis, thus assisting students with the concept of a common vocational education. The need for common elements becomes very evident, for those with leadership responsibilities in supervision, administration, and consulting. A most striking innovation in vocational personnel curriculum development is being undertaken at Wayne State University, where they are attempting to develop an interdisciplinary systems approach to preservice and inservice preparation of teachers, supervisors, and administrators, building on commonalities.

Teacher Supply Recommendations by Occupational Field

01 Agriculture: Total preservice outputs should be increased immediately, with extra attention to the specializations noted as being in short supply. This will mean launching recruitment efforts in the secondary schools and on the university campus, plus changes in the preservice curriculum to accommodate the new specializations required in schools. Ways and means of recruiting and upgrading experienced personnel from agri-business and related fields to fill immediate needs will need close cooperation between school employers and teacher educators, with assistance from the State Personnel Development Unit.

It is not recommended that additional institutions be authorized for teacher education in this area, since the quantitative and qualitative requirements are within the capacity of the existing institution and no other universities have the necessary depth in agricultural science and technology. Furthermore, the usual alternative avenues available in other occupations for acquiring competency, such as community college curricula, apprenticeship, and military service school, do not usually exist in agriculture. (The emergence of need for agri-business and natural resources teaching personnel may modify this somewhat in the future.) Although having more than one institution involved would be healthy, so as to promote competition and have a choice of products, the additional costs of staffing and equipping a second or third institution are prohibitive.

04 Distributive: When secondary and post-secondary requirements for new distributive personnel are aggregated, only a slight continuing oversupply is apparent. This assumes, of course, that community colleges will find them satisfactorily experienced and mature; and that they are needed as cooperative coordinators at all levels. There should be little need to curtail outputs.

Attention to the subspecializations needed must be dealt with, since it makes little sense for all institutions to try to satisfy all subspecialty requirements in such small numbers. Perhaps agreements should be reached between institutions, which would result in assigning certain specialties to specific schools. Preservice curricula options which combine distributive and office education are in demand at some smaller schools.

With coordination of cooperative work experience programs being a forte of distributive education, efforts should be made (1) to broaden the competencies of new personnel so they are capable of handling programs which cover all vocational fields, (2) to make at least a survey course or unit a part of the preservice and inservice preparation of all vocational-technical personnel, and (3) to prepare personnel with the competencies needed for operating coops for Special Needs students.

07 Health: One of the most clear-cut, high-priority recommendations to come from this study of personnel needs is that action must be taken immediately to improve the supply of well-qualified health occupations teachers. It must be a two-pronged approach which provides both a preservice supply with degrees and teaching qualifications, and an inservice scheme to upgrade the teaching competencies of those already hired plus those who must be added from the same sources.

Essentially, a void has existed in preservice programs until very recently, when Ferris State College was approved by the State Board of Education to prepare vocational teachers in some of the health occupations. Inservice teacher education opportunities have been but little better, except for occasional activities noted on the part of some universities.

It would be unwise to proceed immediately to authorize all state institutions to engage in the preservice preparation of these personnel. Designations should be made with due care to such criteria as long-range quantitative requirements, specializations needed, presence of health occupations training departments on campus or in the immediate area, geographical location of universities, and regional needs, plus others. Attention is invited to the prior discussion of health occupation designation as it relates to broadly-based regional services, which appeared under the heading Program Authorization. A decision should be made whether to follow the specialized institution approach limiting the number of universities engaged in this specialty, or the regional system which could put most all institutions into the business. If the latter alternative were to be adopted, many universities would probably need to build curricula on major and minor equivalencies developed elsewhere, i.e., community colleges, work experience, etc.

09 Home Economi . Although a small aggregate oversupply seems to be in the making, the lack of an adequate supply of teachers for wage-earning occupations should be the major focal point of concern. The condition here resembles that of health occupations in both preservice and inservice teacher opportunities. Baccalaureate degree preservice outputs are rare, with the exception of NMU, and inservice courses and workshops are infrequent and irregular. Activities in family life and consumer teacher education appear to come much closer to hitting the mark; therefore the priorities of home economics teacher educators should now be directed toward making provisions for wage-earning vocational teacher programs.

Wage-earning occupations seem to be forming into about four clusters: child care, commercial food service, clothing and related fields, health-related areas, and to some extent housing and home furnishings. The following avenues should prove fruitful: qualifying present vocational home economics teachers who possess the academic requirements through provision of coop work experiences and special courses, adding coop work experience options and courses to preservice degree programs, and upgrading personnel hired from business and industry with vocational teacher education courses.

Workshops for teachers should be promoted, which will assist them in creating programs having more impact on the needs of the disadvantaged and handicapped.

Since the combined total annual requirement for wage-earning occupations teachers at the secondary and post-secondary levels appears to be twenty-five to thirty-five, and since six state and three private institutions are in the business of vocational home economics teacher preparation, the problem of determining which institution should prepare what specializations becomes complex. Attention is referred to the previous paragraphs on Health occupations and to the earlier Program Authorization heading.

14 Office: Too good a job has been done in vocational office teacher education in meeting quantitative requirements. This statement applies to vocational teacher output only. In no way does it cover the supply and demand situation for general (practical or applied arts) office or business teachers. With the prospect of office education teachers being in oversupply, due to projected outputs continuing to rise faster than anticipated requirements for new teachers, the emphasis should be shifted to improving

the quality of personnel and to meeting the needs for specific specializations. This is an enviable stage to have reached. Quality may be increased by becoming more selective at all stages of the preservice process. Inservice teacher upgrading should receive new emphasis. For example, the new integrated office curriculum requires considerable inservice attention. Longer and more varied work experience should replace the compressed schemes sometimes used to meet certification requirements. Workshops to assist existing personnel in developing improved programs for Special Needs youth require attention. Business education teachers with balanced competency in combined distributive and office curricula are needed in many smaller schools.

16 and 17 Technical and Trade: Emphasis should be on finding ways to meet the requirements of the many specializations for which there is insufficient or no supply. These efforts should include preservice baccalaureate and post-degree programs where possible, and inservice schemes for upgrading others, while on the job, to more permanent types of certification. It appears as hopeless to attempt to offer conventional preservice on-campus degree programs at each university for the dozens of specialties which appear from time to time. The time lag between their appearance and the output of matching personnel some years later is too great. Also the quantities are often too small to be financially feasible. Existing stocks of vocational and industrial arts teachers can be retrained through added work experience and courses to meet many of these needs. Attention is directed to earlier comments on the "Common Market" alternative which appeared in the Preservice heading, and to the university degree plan which would recognize major and minor equivalencies developed elsewhere, as was discussed under the Program Authorization heading.

One stream of effort should be to prepare persons for clusters or families of occupations with sufficient breadth for flexibility of assignment, but depth in a specific occupational specialty within the cluster. These people are desired for many programs in smaller schools and in some metropolitan schools where the cluster curriculum concept is functioning. Examples of clusters would be power and energy systems covering automotive, diesel, small engines, recreational equipment, etc., or building construction, which would include carpentry, plumbing, electrical, and the like. Such a scheme would provide more flexible personnel able to adapt to student needs and shifting occupational requirements. Supplementary and continuing work experience opportunities are necessary for the success of this plan.

Cooperative Work Experience Coordinators

The focus of existing and future coop coordinator personnel problems is likely to be qualitative rather than quantitative; thus emphasis should be on inservice development of competencies appropriate to the coordination assignment. Personnel development needs for coop coordinators are listed toward the end of Section IV. Preservice orientation to cooperative coordination should be required of all vocational teacher candidates, in the form of a course or unit in a course.

Administrators/Supervisors/Directors

The primary emphasis with administrative personnel should be in the inservice realm, taking the form of intensive workshops and institutes which concentrate on new competencies and information. The State Office should take the lead in this matter, identifying needs, sponsoring and funding activities, and locating top-notch specialists from the private and public realms to conduct the inservice instruction. Contractual arrangements should be utilized, when appropriate. Perhaps quarterly workshops conducted by the State Office could be instituted. Teacher educators should be invited to attend as participants along with the administrators, since their inservice needs coincide in many respects. The same goes for consultants or specialists and State Office personnel.

Administrators should be involved in identifying and setting priorities, as was done to produce the list of competencies and training needs which appears toward the end of Section IV. The administrators' organizations are logical existing bodies which would be helpful in this endeavor. Examples taken from the list which are representative of immediate needs are managing by objectives, developing differentiated staffing patterns, planning annual and long-range goals, implementing programs for the disadvantaged and handicapped, and managing inservice programs for local staff. Topics of common worth to all administrators could be offered regionally, while those of a more specialized appeal would warrant statewide gatherings.

Preservice administrator training should also be available in the state, in order to create a pool of personnel ready to fill openings as they occur. In past decades there often was no such reservoir of trained personnel available when vocational education programs expanded in spurts, as following the 1963 federal legislation. Most positions had to be filled with promising individuals with little administrative experience, who then had to learn on the job. There is too much at stake today to warrant reliance on this haphazard approach to staffing. Leadership development programs such as the one at the University of Michigan, which identifies promising secondary and post-secondary personnel for intensive training, are necessary. The success of this program over recent years is witnessed by the placement of the vast majority of its outputs in key positions in Michigan, as well as out of state. The new EPDA-supported leadership development program at Michigan State University, leading to the doctoral degree, is intended to fill the need for leadership personnel in somewhat different positions. Both should include internships as an integral part of their curricula.

Consultants/Specialists

Personnel development activities for consultants and specialists should have both an inservice and preservice element, with emphasis clearly on the former. Most of the suggestions made in the previous paragraph about administrative personnel also apply here, since many of the competencies and training needs coincide closely. The largest single group of consultants and specialists in Michigan is composed of the personnel in the State Vocational Education and Career Development Services Office in Lansing. A program of inservice staff development along the lines outlined in the January 20, 1970, proposal submitted to the USOE for EPDA funds by the State Board of Education should be implemented. The inservice needs outlined therein were (1) new staff orientation and training, (2) special needs programming, (3) written communication, and (4) general staff support. Placement of operational responsibility for staff development with the Research Coordinating Unit is desirable because this function should be somewhat removed from the State Vocational Education Services Office to realize maximum effectiveness.

Guidance and Placement Personnel

The considerable amount of divergence about the nature of qualified vocational guidance workers should be clarified by the development of a list of the professional competencies desired. It is suggested that vocational guidance personnel should have the same common base as all guidance workers, but should also have extensive additional specialized training for vocational guidance. All secondary guidance personnel should have at least a foundation in vocational guidance. It is not necessary for vocational guidance personnel to be former vocational teachers in order to be competent, but it is generally throught that recent work experience in a variety of occupations should be an ingredient of this specialization. Strong emphasis should be placed on work experience in business and industry, coupled with seminars during the summer vacation; and workshops focusing on local and regional employment opportunities, training requirements and opportunities, and vocational career development theory. A course in the philosophy, forms, and issues of vocational-technical education should be included.

Area vocational centers pose a special situation for the guidance function, since activities must be coordinated with sending schools. Long-term workshops covering several months, up to a year prior to the opening of center classes, should receive top inservice priority. Activities similar to those conducted by the Ingham Intermediate School District with guidance personnel from participating secondary schools and with assistance from university personnel should be supported. Use of state and federal personnel development funds are warranted.

Seven of the eight state institutions were authorized for vocational guidance personnel development between 1945 and 1960, with mixed impact on personnel requirements. Little of a tangible nature seems to have happened. Ideally, all of these guidance worker professional programs should include the vocational element, so that all personnel output in the state would be equipped. But since this apparently hasn't produced much result, it is suggested that one or two specific institutions be given contracts to develop pilot schemes which should then be either adopted by other institutions or made available throughout the state by the contractors.

Researchers

The normal doctoral output of Michigan universities, plus that of the new leadership development program supported by EPDA, Section 552, funds and leading to the doctoral degree at Michigan State University, should produce sufficient researchers to fill Michigan positions. Similar programs throughout the nation create a pool of persons for interstate recruitment.

Paraprofessionals

Most paraprofessionals are recruited from local business and industry and are trained on the job; this is likely to persist. Because of this situation and the small numbers involved, there seems to be little need for organizing group training programs at this time, except, of course, for special projects. Training needs will have to be solved individually on an inservice basis, with leadership from local supervisors and some support funds from local and state sources.

More attention should be given to differentiated staffing training needs, including the paraprofessionals, in order to improve the quality of instruction and better utilize the special talents of each type. Often it is the paraprofessional who holds the key to success because he may be able to get closer to the students. Sometimes paraprofessionals, persons who would not qualify for vocational teaching certificates, are the best people for various Special Needs programs, especially those for the disadvantaged.

Emerging and Special Needs Requirements

The necessity for providing professionally competent personnel to engage in vocational-technical programs for the handicapped and disadvantaged is of top-flight priority. (Also included are programs for migrants, Indians, vocational rehabilitation, mentally retarded, manpower retraining, prisons, etc.) We have been unable to define satisfactorily the quantitative dimensions of these personnel requirements. Some success was achieved, however, in identifying qualitative needs of these personnel, as can be noted in the final protion of Section IV. Time and energy did not allow for the successful definition of all the apparent personnel requirements which abound in Michigan. Special Needs personnel requirements

are particularly difficult to pin down, since they are in their formative stages, but both the quantitative and qualitative dimensions should soon emerge. Ad hoc means for staffing and staff development are currently in use to get programs underway. Much of the development need is with experienced teachers who could benefit by inservice workshops and short courses. Those who work with the disadvantaged need human relations training to assist them in responding positively to unusual situations. Preservice and inservice avenues should be opened for minority peoples desiring to become vocational teachers. Stipends should be available as an inducement.

Individual teacher education institutions with interest and staff resources, or other agencies and individuals, should be identified and assigned contracts to define qualitative competency requirements, develop appropriate training programs, and carry on training activities. For example, Central Michigan University, with its Migrant Education Center and its vocational-technical education staff, could address itself to developing programs and personnel to assist migrants. Eastern Michigan University and Western Michigan University (and others) appear to have strong special education departments, with expressed interest in cooperating with vocational education. Similarly, the personnel development needs of other facets of disadvantaged and handicapped programs should receive attention from teacher education institutions and/or other agencies. Recent events have drawn attention to the need for viable vocational-technical education programs in the rehabilitation of prisoners and parolees. Personnel development for these programs is in need of systematic definition and action from the State Vocational Education Services, State Corrections Department, and some teacher education institution(s).

Differentiated staffing pattern models for vocational-technical education should receive special focus because of the scores of new area vocational centers to be developed in the 1970's. This would be a timely action research project in which the State Office should involve teacher educators and directors of selected new centers. Personnel requirements for the World of Work programs are also in need of further definition and it appears that good progress is being made in this direction.

Teacher Educators

Universities should give direct, planned attention to the inservice professional development needs of their faculties. Unfortunately, their needs are usually the last of all the professional group needs in the state to receive attention. Normally, little support is offered to the individual faculty member for activities other than attendance at instate professional meetings, an occasional out-of-state conference, and a rare sabbatical leave. Faculty desiring refresher courses and new work experience in their occupational specialties are in the most difficult position. They are supposed to keep up with their fields by independent reading, field visits, and course work. In fact, they are expected to take care of their own professional development and pay for it themselves. Yet business and industry make a regular policy of sending staff to various pertinent training schemes at company expense. Additional resources should be made available to subsidize involvement in various worthwhile activities, and on university time if necessary.

Preparation programs for vocational teacher educators should include a heavy emphasis on the commonalities. It is not enough to prepare specialized home economics or agriculture teacher educators. They must also have a grasp of the total field of vocational-technical or occupational education. Foundations of vocational education should be stressed and linked with the foundations of education.

The serious, long-standing communication problem between teacher education institutions and the State Office, as discussed earlier under the heading State Personnel Development Unit, should receive immediate attention. It would be a good idea to include teacher educators in the regional and statewide meetings called by the State Office for administrators, consultants, etc. Inservice workshops and institutes sponsored by the State Office for most other personnel groups would be of interest to many teacher educators. This would assist in keeping teacher educators informed of developments. Comparison of the competency and training needs listed at the end of Section IV will reveal many common needs.

Personnel exchange programs between universities, the State Vocational Services Office, secondary and post-secondary schools, government, business and industry, etc., should be promoted. For example, it would be worthwhile to attach a faculty member to the State Personnel Development Unit on a regular rotating basis,

and for State Vocational Office personnel to take up duties at a university. This would do much to promote mutual understanding.

Summary

The outline of a unique Michigan plan for coordinating the development of an adequate supply of vocational-technical education personnel was presented in this Section. Major goals to be attended to and variables to be recognized have been enumerated. A schematic plan and procedure for implementation have been included too. Many alternatives and recommendations for dealing with numerous facets of personnel development have been offered for the primary attention of teacher educators, State Office personnel, school and college administrators, and leadership of professional organizations. It is the intent of those who initiated this study and who produced this report that the results will be beneficial to those wanting to better understand the problems of vocational-technical personnel development in Michigan, and desiring to take action to improve the delivery systems through the subsequent development of an effective, viable, coordinated statewide plan.

BIBLIOGRAPHY

BIBLIOGRAPHY

Personnel Development

1. The American Association of Colleges for Teacher Education. Teacher Education Issues and Innovation. Washington: The American Association of Colleges for Teacher Education, 1968.

2. Barlow, Melvin L. Professional Development in Teacher Education/A National EPDA Assessment Project/ Vocational Education. A progress report for review to the Convention of the Teacher Education Department, American Vocational Association, New Orleans, Louisiana, December 8, 1970. Prepared by the Division of Vocational Education, Los Angeles, California, 1970.

3. Brown, Donald V. Planning Immediate and Long Range Teacher Education Programs in Vocational Education. A report prepared by the College of Education of the University of Tennessee for the U.S. Department of Health, Education, and Welfare, Office of Education, No. OEG-0-9-52034-4136(725). Knoxville, Tennessee: University of Tennessee, 1969.

4. Coster, John K. "The Development of a Vocational-Technical Education Personnel Development Program in a State." An unpublished paper presented at the Vocational Education Leadership Training Institute held at Princeton, New Jersey. Raleigh, North Carolina: North Carolina State University at Raleigh, 1969. (Mimeographed.)

5. Cotrell, Calvin J., et al. "Model Curricula for Vocational and Technical Teacher Education/Teacher Career Analysis." Unpublished discussion copy. Columbus, Ohio: The Center for Vocational and Technical Education, The Ohio State University, 1970. (Mimeographed.)

6. Cotrell, Calvin J. Report of a National Invitational Research Planning Conference on Trade and Industrial Teacher Education. A report prepared by The Center for Research and Leadership Development in Vocational and Technical Education. The Ohio State University, sponsored by the U.S. Office of Education. Columbus, Ohio: The Ohio State University, 1966.

7. Davies, Don. "Which Statistics Do You Read?" American Vocational Journal, Vol. 45 (November, 1970), 90-92.

8. Dapper, Gloria, and Murphy, Judith. Part-Time Teachers and How They Work. New York: Catalyst, 1968.

9. Dillon, Roy D. Seminar for Preparation of Professional Personnel for Vocational-Technical Education. A report prepared by the College of Agriculture and Home Economics, University of Nebraska, for the U.S. Office of Education, No. OEG-0-8-080358-3594. Lincoln, Nebraska: University of Nebraska, 1969.

10. Evans, Rupert N. Foundations of Vocational Education. Columbus, Ohio: Charles E. Merrill Publishing Co., 1971.

11. Evans, Rupert N.; Mangum, Garth L.; and Pragan, Otto. Education for Employment: the background and potential of the 1968 vocational education amendments. Ann Arbor: Institute of Labor and Industrial Relations, University of Michigan and Wayne State University, 1969.

12. Evans, Rupert N., and Terry, David R. Vocational Teacher Education. A report prepared by the Bureau of Education Personnel Development, United States Office of Education and the Office of Superintendent of Public Instruction, Report No. PDT-AO-030 (TEVOTEC), Urbana, Illinois: University of Illinois, 1971.

13. Ferguson, Edward T., and Bice, Garry R. (eds.). Third Annual National Vocational-Technical Teacher Education Seminar Proceedings/Teaching Disadvantaged Youth. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 24, VT 010 163. Columbus, Ohio: The Ohio State University, 1970.

14. Ferguson, Edward T. (ed.). Emerging Teacher Education Curricular Models. A report of the Fourth Annual National Vocational-Technical Teacher Education Seminar Proceedings by The Center for Vocational and Technical Education, The Ohio State University, for the U.S. Office of Education, No. 33. Columbus, Ohio: The Ohio State University, 1970.

15. Gibbs, Jeffrey L. The Education, Sources, and Recruitment of Wisconsin Vocational-Technical Teachers. The Center for Studies in Vocational and Technical Education, University of Wisconsin, June, 1970.

16. Hensel, James W., and Bice, Garry R. (eds.). Second Annual National Vocational-Technical Teacher Education Seminar Proceedings. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 17, OEG-3-7-000158-2037. Columbus, Ohio: The Ohio State University, 1969.

17. Hensel, James; Bishop, Douglas D.; and Crunkilton, John R. Men Separating from the Military Service as a Potential Source of Teachers for Vocational and Technical Schools. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 13. Columbus, Ohio: The Ohio State University, 1967.

18. Illinois Board of Vocational Education and Rehabilitation, Professional and Curriculum Development Unit. State Plan Supplement/State Program for Personnel Delivery System for Occupational Education. Springfield, Illinois, July 1, 1971.

19. Klaurens, Mary. Developing Innovative Vocational-Technical Teacher Education Programs. A report of an Upper Midwest Vocational Teacher Education Conference by the Minnesota Research Coordination Unit in Occupational Education of the University of Minnesota. Minneapolis, Minnesota: University of Minnesota, 1968.

20. Parks, Darrell L. "A State Model for Professional Personnel Development in Vocational Education." Paper presented at a National Workshop on Comprehensive Vocational Education Professional Personnel Development and Utilization by the Division of Vocational Education, Ohio State Department of Education, Washington, June 15-17, 1971.

21. Rhodes, James A. Alternative to a Decadent Society. Indianapolis, Indiana: Howard W. Sams and Co., Inc., 1969.

22. Richland, Malcolm, and Rosove, Perry E. A Study of Potential Utilization of Retiring Military Personnel in Vocational and Technical Education Programs. A report prepared by the System Development Corporation for the U.S. Department of Health, Education, and Welfare, Office of Education, No. OE-6-85-033. Santa Monica, California: System Development Corporation, 1967.

23. Schmitt, Carlos R. "A Study of the Problems of Part-Time Industrial and Technical Instructors in Selected Michigan Community Colleges." Unpublished Ph.D. dissertation, Michigan State University, 1971.

24. Shank, Paul C., and McElroy, Wayne R. The Paraprofessionals. Midland, Michigan: Pendell Publishing Co., 1970.

25. Smith, B. Othanel; Cohen, Saul B.; and Pearl, Arthur. Teachers for the Real World. Washington: The American Association of Colleges for Teacher Education, 1969.

26. U.S. Department of Health, Education, and Welfare, Office of Education. "East-Central Regional Leadership Training Institute." A report prepared at Wayne State University, No. OEG-0-9-406006-2453-725. Detroit: Wayne State University, 1970. (Mimeographed.)

27. U.S. Department of Health, Education, and Welfare, Office of Education. The Education Professions. Report No. HE 5.258:58032-70. Washington: U.S. Government Printing Office, 1970.

28. U.S. Department of Health, Education, and Welfare, Office of Education. Education Professions Development Act. Report No. OE-58030-72. Washington: U.S. Government Printing Office, 1970.

29. U.S. Department of Health, Education, and Welfare, Office of Education. Meeting Critical Shortages of Classroom Personnel. A report prepared by the Bureau of Educational Personnel Development, No. OE-580034. Washington: U.S. Government Printing Office, 1970.

30. U.S. Department of Health, Education, and Welfare, Office of Education. National Planning and Development Committees in Trade and Industrial Education. A report prepared by the Division of Vocational and Technical Education of the Bureau of Adult, Vocational, and Library Programs, Office of Education. Terre Haute, Indiana: Vocational Instructional Materials Laboratory, Department of Vocational/Technical Education, Indiana State University, 1968.

31. U.S. Department of Health, Education, and Welfare, Office of Education. Partners in Industrial-Technical Teacher Education/The Cooperative Roles of the Community--Junior Colleges and the Senior Institutions. A report prepared by the Industrial Education Department of Western Michigan University, No. OEG-0-8-070074-3713(085). Kalamazoo, Michigan: Western Michigan University, 1969.

32. U.S. Department of Health, Education, and Welfare, Office of Education. Vocational Education/The Bridge Between Man and His Work. A report prepared by the Advisory Council on Vocational Education, No. OE 80052. Washington: U.S. Government Printing Office, 1968.

33. Venn, Grant. Man Education and Work/Postsecondary Vocational and Technical Education. Washington: American Council on Education, 1964.

34. Venn, Grant. Needs in American Education, Goals for the U.S. Office of Education. n.d. (Mimeographed.)

35. Verduin, John R., Jr. Conceptual Models in Teacher Education. Washington: The American Association of Colleges for Teacher Education, 1967.

36. Vivian, Neil E., and Hoffman, Kenneth E. Vocational-Technical Teacher Education: National Seminar Proceedings. A report by The Center for Vocational and Technical Education. The Ohio State University, sponsored by the U.S. Office of Education, No. 15. Columbus, Ohio: The Ohio State University, 1968.

Manpower Reports and Methodology

37. Goldstein, Harold, and Swerdloff, Sol. Methods of Long-Term Projection of Requirements for and Supply of Qualified Manpower. Paris: UNESCO, 1967.

38. Harbison, Fredrick, and Myers, Charles A. Education, Manpower, and Economic Growth. New York: McGraw-Hill Book Co., 1964.

39. Harbison, Fredrick, and Myers, Charles A. Manpower and Education. New York: McGraw-Hill Book Co., 1965.

40. Kelly, James D. Michigan Technician Need Study. A report prepared by the Office of Administrative Studies at Ferris State College for the Michigan Department of Education and the Michigan Department of Commerce. Big Rapids, Michigan: Ferris State College, 1967.

41. Kelly, James D. Summary Report on the Michigan Technician Need Study. A report prepared by the Office of Administrative Studies at Ferris State College for Michigan Department of Commerce. Big Rapids, Michigan: Ferris State College, 1967.

42. Michigan Manpower Commission. "The Michigan Manpower Report to the Governor." An unpublished report prepared by the Michigan Manpower Commission. Lansing, Michigan, 1970.

43. National Education Association. Teacher Supply and Demand in Public Schools, 1970. A report prepared by the Research Division, National Education Association, No. 1970-R14. Washington: National Education Association, 1970.

44. Parnes, Herbert S. Forecasting Educational Needs for Economic and Social Development. A report of the Mediterranean Regional Project prepared by the Organisation for Economic Co-operation and Development. Paris: Organisation for Economic Co-operation and Development, 1962.

45. Pinsky, David. Conference on Manpower Surveys for Vocational-Technical Educational Planning. A report prepared by the Labor Education Center of The University of Connecticut for the U.S. Department of Health, Education, and Welfare, No. OEG-0-8-080410-3604(085). Storrs, Connecticut: The University of Connecticut, 1969.

46. Smith, Harold T. Education and Training for the World of Work/A Vocational Education Program for the State of Michigan. Kalamazoo, Michigan: The W. E. Upjohn Institute for Employment Research, 1963.

47. State of Michigan. Michigan Manpower Study. A report prepared by Battelle Memorial Institute for the State of Michigan. Columbus, Ohio: Battelle Memorial Institute, 1966.

48. U.S. Department of Labor. A Bibliography of Manpower Projections for the North Central Region. A report prepared by the Bureau of Labor Statistics of the U.S. Department of Labor, North Central Region Report No. 5. Chicago: U.S. Government Printing Office, 1968.

49. U.S. Department of Labor. Manpower Report of the President. Washington: U.S. Government Printing Office, 1970.

50. U.S. Department of Labor. Manpower Research Projects. A report prepared by the Manpower Administration of the U.S. Department of Labor. Washington: U.S. Government Printing Office, 1967.

51. U.S. Department of Labor. Occupational Employment Patterns for 1960 and 1975. A report prepared by the Manpower Administration, Bureau of Labor Statistics, No. 1599. Washington: U.S. Government Printing Office, 1968.

52. U.S. Department of Labor. U.S. Manpower in the 1970's/ Opportunity and Challenge. Washington: U.S. Government Printing Office, 1970.

53. Young, Robert C. Manpower Information for Vocational Education Planning. A report of a conference by The Center for Vocational and Technical Education, The Ohio State University, No. 21, OEG-3-7-000158-2037. Columbus, Ohio: The Ohio State University, 1969.

Other Michigan Reports and Data

54. Hecker, Stanley E. Actual and Projected Pupil Population Public, Non-public and Total Michigan 1961-62 to 1978-79. East Lansing, Michigan: Michigan Education Association, 1970.

55. Kicklighter, Clois E. An Analysis of Selected Factors Related to Industrial Education College Students in Michigan. Lansing: The Michigan Industrial Education Society, 1969.

56. Michigan Department of Education. Annual Report of the State Advisory Council for Vocational Education. A report prepared by the Michigan Advisory Council for Vocational Education of the Division of Vocational Education. Lansing, Michigan: Michigan Department of Education, Division of Vocational Education, 1970.

57. Michigan Department of Education. The Common Goals of Michigan Education. A report prepared by the Task Force on Goals. Lansing, Michigan: Michigan Department of Education, 1970.

58. Michigan Department of Education. Degrees and Awards Conferred in Michigan Colleges and Universities 1967-1968. Statistical Bulletin No. 4056. Lansing, Michigan: Michigan Department of Education, 1969.

59. Michigan Department of Education. Descriptive Report of Program Activities for Vocational Education. Lansing, Michigan: Michigan Department of Education, 1970.

60. Michigan Department of Education. Michigan Guide for the Administration of Vocational-Technical Education Programs. Lansing, Michigan: Division of Vocational Education, 1970.

61. Michigan Department of Education. The Michigan State Plan for Vocational Education (3 parts). Lansing, Michigan: Vocational Education and Career Development Services, 1971.

62. Michigan Department of Education. 1970-71 Directory of Institutions of Higher Education. Lansing, Michigan: Michigan Department of Education, 1971.

63. Michigan Department of Education. "Objectives and Goals for Vocational Education in Michigan." An unpublished report prepared by the Division of Vocational Education. Lansing, Michigan, 1970. (Mimeographed.)

64. Michigan Department of Education. Occupational Program Inventory. Statistical Bulletin No. 4057. Lansing, Michigan: Michigan Department of Education, 1969.

65. Michigan Department of Education. Professional Personnel in Michigan Public Schools. Lansing, Michigan: Michigan Department of Education, 1969.

66. Michigan Department of Education. State Plan for Higher Education in Michigan. Lansing, Michigan: Michigan Department of Education, 1969.

67. Michigan Department of Education. Supplement to Occupational Program Inventory. Statistical Bulletin No. 4057A. Lansing, Michigan: Michigan Department of Education, 1970.

68. Michigan Department of Education. A Tentative Plan for the Development of Area Vocational Education Centers in Michigan. Lansing, Michigan: Michigan Department of Education, 1970.

69. Michigan Department of Education, Vocational Education and Career Development Services. "Position Papers on Various Program Elements of the Vocational Education and Career Development Services." Unpublished discussion copy, Michigan Department of Education, Vocational Education and Career Development Services, 1971.

70. Michigan Department of Education. Vocational Education Services of the Michigan Department of Education. Lansing, Michigan: State Board of Education, 1970.

71. Michigan Department of Public Instruction, Division of Vocational Education. "A Survey of Anticipated Need for Vocational-Technical Education Teachers in Michigan." Unpublished survey. Lansing, Michigan, Michigan Department of Public Instruction, Division of Vocational Education, 1965. (Mimeographed.)

72. Michigan State Board of Education. Council on Higher Education--Community College Proposals. Position papers of Michigan public community and junior colleges prepared by the State Board for Public Community and Junior Colleges. Lansing, Michigan: Michigan State Board of Education, 1971.

Other Federal Reports and Data

73. Kay, Evelyn R. Inventory of Vocational Education Statistics Available in Federal Agencies. A report prepared by the National Center for Educational Statistics for the U.S. Department of Health, Education, and Welfare, Office of Education, No. HE 5.280:80069. Washington: U.S. Government Printing Office, 1970.

74. Notes and Working Papers Concerning the Administration of Programs Authorized under Vocational Educational Act of 1963, Public Law 88-210, as Amended. A report prepared for the Committee on Education, Committee on Labor and Public Welfare of the United States Senate. Washington: U.S. Government Printing Office, 1968.

75. Putnam, John F., and Chismore, W. Dale (eds.). Standard Terminology for Curriculum and Instruction in Local and State School Systems. A report prepared by the National Center for Educational Statistics for the U.S. Department of Health, Education, and Welfare, Office of Education, No. OE-23052. Washington: U.S. Government Printing Office, 1970.

76. U.S. Congress. Vocational Education Amendments of 1968. Public Law 90-576, 90th Congress, October, 1968.

77. U.S. Department of Commerce. Statistical Abstract of the United States 1970. Washington: U.S. Government Printing Office, 1970.

78. U.S. Department of Health, Education, and Welfare, Office of Education. Selected Statistics on Educational Personnel. A report prepared by the National Center for Educational Statistics, No. HE 528:58041. Washington: U.S. Government Printing Office, 1970.

79. U.S. Department of Health, Education, and Welfare, Office of Education. Vocational and Technical Education. No. HE 5.280:8008-68. Washington: U.S. Government Printing Office, 1968.

80. U.S. Department of Health, Education, and Welfare, Office of Education, and U.S. Department of Labor Manpower Administration. Vocational Education and Occupations. No. OE-80061. Washington: U.S. Government Printing Office, 1969.

Sources of Research

81. American Educational Research Association. Review of Educational Research/Vocational, Technical, and Practical Arts Education. Washington: American Educational Research Association, 1968.

82. Ashmun, Richard D., and Larson, Roger A. Review and Synthesis of Research on Distributive Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 54, VT 010 125. Columbus, Ohio: The Ohio State University, 1970.

83. Brandon, George L. (ed.). Research Visibility. Washington: American Vocational Association, 1970.

84. Carpenter, Earl T., and Rodgers, John H. Review and Synthesis of Research in Agricultural Education, Second Edition. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 59, VT 010 881. Columbus, Ohio: The Ohio State University, 1970.

85. Griessman, B. Eugene, and Densley, Kenneth G. Review and Synthesis of Research on Vocational Education in Rural Areas. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 50. Columbus, Ohio: The Ohio State University, 1969.

86. Holloway, Lewis D., and Kerr, Elizabeth E. Review and Synthesis of Research in Health Occupations Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 39. Columbus, Ohio: The Ohio State University, 1969.

87. Householder, Daniel L., and Suess, Alan R. Review and Synthesis of Research in Industrial Arts Education, Second Edition. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 42. Columbus, Ohio: The Ohio State University, 1969.

88. Larson, Milton E. Review and Synthesis of Research: Analysis for Curriculum Development in Vocational Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 46, VT 010 138. Columbus, Ohio: The Ohio State University, 1969.

89. Larson, Milton E. Review and Synthesis of Research in Technical Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University. Columbus, Ohio: The Ohio State University, 1966.

90. Law, Gordon F. (ed.). Research Visibility. Washington: American Vocational Association, 1969.

91. Little, J. Kenneth. Review and Synthesis of Research on the Placement and Follow-up of Vocational Education Students. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 49, VT 010 175. Columbus, Ohio: The Ohio State University, 1970.

92. Moss, Jerome Jr. Review of Research in Vocational Technical Teacher Education. A report prepared by the Minnesota Research Coordination Unit in Occupational Education, University of Minnesota. Minneapolis, Minnesota: University of Minnesota, 1967.

93. Nelson, Helen Y. Review and Synthesis of Research on Home Economics Education, Second Edition. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 57, VT 010 721. Columbus, Ohio: The Ohio State University, 1970.

94. Olivo, C. Thomas (ed.). Research Visibility. Washington: American Vocational Association, 1968.

95. Pautler, Albert J., and Schaefer, Carl J. Review and Synthesis of Research in Trade and Industrial Education, Second Edition. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 43. Columbus, Ohio: The Ohio State University, 1969.

96. Phillips, Donald S., and Briggs, Lloyd D. Review and Synthesis of Research in Technical Education, Second Edition. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 47. Columbus, Ohio: The Ohio State University, 1969.

97. Price, Ray G., and Hopkins, Charles R. Review and Synthesis of Research in Business and Office Education, Second Edition. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 55, VT 010 722. Columbus, Ohio: The Ohio State University, 1970.

98. U.S. Department of Health, Education, and Welfare, Office of Education. Thesaurus of ERIC Descriptors, Second Edition. No. OE-12031-69. Washington: U.S. Government Printing Office, 1969.

99. Wallace, Harold R. Review and Synthesis of Research on Cooperative Vocational Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 60, VT 010 859. Columbus, Ohio: The Ohio State University, 1970.

100. Warmbrod, J. Robert, and Phipps, Lloyd J. Review and Synthesis of Research in Agricultural Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University. Columbus, Ohio: The Ohio State University, 1966.

101. Warmbrod, J. Robert. Review and Synthesis of Research on the Economics of Vocational Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 16, OEG-3-7-000158-2037. Columbus, Ohio: The Ohio State University, 1968.

102. Wenrich, Ralph C. Review and Synthesis of Research on the Administration of Vocational and Technical Education. A report prepared by The Center for Vocational and Technical Education, The Ohio State University, No. 48, VT 010 173. Columbus, Ohio: The Ohio State University, 1970.

APPENDICES

APPENDIX 1.--ENROLLMENTS BY OCCUPATIONAL AREAS (ALL LEVELS), 1918-1970

Year	Agriculture	Distributive & Office	Homemaking	Trade & Industry	Technical	Total
1918	2,474		1,281	3,463		7,218
1922	3,634		7,228	15,268		26,130
1926	5,446		8,125	24,667		38,238
1930	8,996		10,753	28,050		47,799
1934	12,954		8,572	18,517		40,143
1938	7,305	1,266	22,226	25,983		56,780
1942	10,662	6,396	31,517	30,671		79,246
1943	10,495	5,978	25,726	27,586		69,785
1944	8,893	6,581	24,904	22,378		62,756
1945	8,776	5,627	34,786	28,355		77,544
1946	11,577	4,923	37,878	28,756		83,134
1947	10,847	5,009	36,513	35,450		87,819
1948	17,379	5,855	40,572	44,723		108,529
1949	15,612	9,312	44,447	43,078		112,449
1950	16,265	12,287	47,471	37,842		113,865
1951	18,845	11,809	45,370	34,220		110,244
1952	22,016	10,689	47,852	36,822		117,379
1953	20,313	15,644	48,384	36,932		121,273
1954	19,128	17,288	53,325	37,852		127,593
1955	17,813	20,864	54,835	36,205		129,817
1956	18,622	23,444	56,559	36,839		135,464
1957	18,688	23,106	58,307	41,628		141,729
1958	17,426	22,925	57,616	42,506		140,473
1959	17,550	18,519	58,908	42,848	3,257	141,082
1960	17,327	18,163	56,703	41,583	4,473	138,249
1961	16,563	16,189	56,967	44,608	5,336	139,663
1962	16,765	19,878	60,873	42,776	5,694	145,986
1963	16,099	22,353	63,879	47,691	6,292	156,314
1964	16,085	25,632	60,887	53,258	6,965	162,827
1965	15,028	28,162	73,067	56,790	6,697	179,744
1966	15,143	91,938	76,112	73,367	8,232	264,792
1967	15,087	87,766	80,012	74,346	8,269	265,480**
1968	13,930	95,228	84,848	80,697	8,930	283,633
1969	13,697	96,408	91,045	94,212	8,774	304,136
1970	14,121	98,191	96,239	100,767	9,844	326,936

**The growth in actual enrollments was appreciably greater than the total for 1967 would indicate. Enrollments duplications reported by local schools in past years were eliminated this year by a change in the reporting forms provided for local programs.

Source: (59)

APPENDIX 2.--ENROLLMENTS IN VOCATIONAL EDUCATION PROGRAMS, 1969/70

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

BUDGET BUREAU NO. 51-R084
APPROVAL EXPIRES 3/31/71

ENROLLMENTS IN VOCATIONAL EDUCATION PROGRAMS

Read instructions on reverse before completing this form

STATE OUTLYING AREA: Michigan
DATE PREPARED: 10/9/70
FISCAL YEAR ENDING: June 30, 1970
REPORT DUE: October 1, 1970

PROGRAM SUMMARY	TOTAL	DISADVANTAGED	HANDICAPPED	ELEMENTARY AND SECONDARY	POST-SECONDARY	ADULT	APPRENTICESHIP	WORK-STUDY	COOPERATIVE	COMPLETIONS	LEFT PRIOR TO NORMAL COMPLETION TIME WITH MARKETABLE SKILLS
1	2	3	4	5	6	7	8	9	10	11	12
1. GRAND TOTAL (Unduplicated)	327,235	2025 (8399)	NA*	170,217	34,954	122,064	20,726	*	30,758	77,640	0
SPECIAL DATA 2. EXEMPLARY	299	255	0	299	0	0	-	0	0	252	0
3. GROUP GUIDANCE	0	0	0	0	0	0		0	0	0	
4. PREPOSTSECONDARY	0	0	0	0				0	0	0	
5. REMEDIAL	0	0	0	0	0	0	0	0	0		
6. WORK-STUDY	NA*	NA	NA	NA	NA				NA	NA	
7. HANDICAPPED	**		**	**	**	**	**	**	**	**	**
8. DISADVANTAGED	2025 (8399)	2025 (8399)		2025 (8330)	69	0	0	NA	1129 (751)	264	0
9. COOPERATIVE B	30,758	134 (1831)	NA	28,042	2716			NA		20,394	0
10. COOPERATIVE G	0	0	0	0	0			NA		0	0
11. MALE	158,978	1481 (2215)	NA	52,728	23,327	82,923	20,714	NA	13,413	28,110	0
12. FEMALE	168,257	544 (6184)	NA	117,489	11,627	39,141	9	NA	17,345	49,278	0
13. BELOW GRADE 7	0	0	0	0							
14. GRADES 7-8	274	255	0	274					0		
15. GRADES 9-12	169,943	1770 (8057)	NA	169,943				NA	28,078	70,506	0
16. POSTSECONDARY, 1ST YEAR	16,672	34	NA		16,672			NA	1,235	1,699	0
17. POSTSECONDARY 2ND YEAR AND ABOVE	18,282	35	NA		18,282			NA	1,445	5,047	0
18. ADULT PREPARATORY	10,356	0	0			10,356				136	0
19. ADULT SUPPLEMENTAL	111,708	0	0			111,708	0				
20. MINORITY GROUPS ***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

OE FORM 3138, 6 70 REPLACES OE FORM 4048, 2 69, WHICH IS OBSOLETE

*Data for summer work-study program will be available later

***Minority group information was not included on state forms

( ) = Disadvantaged students in regular programs

** Handicapped and disadvantaged were grouped uner "Special Needs" on this year's forms. Forms being revised for next year.

Source: Michigan Department of Education, Vocational Education Services Files.

APPENDIX 3a.--ESTIMATED NUMBER OF PERSONS 20 TO 29 YRS. OLD*, MICHIGAN 1969 TO 1989

Year	Number	Percent	Year	Number	Percent
1969	1,290,298	100.00%	1980	1,932,255	149.75%
1970	1,351,247	104.72	1981	1,952,629	151.33
1971	1,416,200	109.76	1982	1,957,584	151.72
1972	1,469,967	113.92	1983	1,953,487	151.40
1973	1,527,494	118.38	1984	1,936,486	150.08
1974	1,606,012	124.47	1985	1,906,656	147.77
1975	1,690,749	131.04	1986	1,866,382	144.65
1976	1,758,245	136.27	1987	1,820,650	141.10
1977	1,806,458	140.00	1988	1,781,407	138.06
1978	1,855,422	143.80	1989	1,752,111	135.79
1979	1,897,254	147.04			

*These "guesses" are based upon the number of live births in Michigan between 1940 and 1969. They do not reflect either in or out migration from the state or deaths during the entire period from 1940 to 1989. The point to be made is the significant increase in the relative size of this age group (up 24.47% in 1974 over 1969; up 51.72% in 1982 over 1969; etc.).

Source: (54).

APPENDIX 3b.--PROJECTED TOTAL SCHOOL MEMBERSHIP PUBLIC AND NON-PUBLIC.

		Years						
Grade	Actual 1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
K	173,708	173,100	170,100	166,300	173,300				
Diff.	-11,937	- 708	- 2,900	- 3,800	+ 7,000				
1	191,512	179,300	178,600	175,600	171,600	178,900			
2	190,936	186,300	174,500	173,800	170,900	167,000			
3	189,501	188,100	183,500	171,900	171,200	168,300	164,500		
Sub.	571,949	533,700	536,600	521,300	513,700	514,200			
Diff.	-10,851	-18,249	-17,100	-15,300	- 7,600	+ 500			
4	193,410	188,300	186,900	182,300	170,800	170,100	167,200	163,500	
5	190,330	191,400	186,300	184,900	180,400	169,000	168,300	165,400	
6	189,747	189,200	190,300	185,200	183,800	179,300	168,000	167,300	
Sub.	573,487	568,900	563,500	552,400	535,000	518,400	503,500	496,200	
Diff.	+ 323	- 4,587	- 5,400	-11,100	-17,400	-16,600	-14,900	- 7,300	
K-6	1,319,144	1,295,600	1,270,100	1,239,600	1,221,300				
Diff.	-26,349	-23,544	-25,500	-30,500	-18,300				

Source: (54).

APPENDIX 3c.--PROJECTED TOTAL SCHOOL MEMBERSHIP PUBLIC AND NON-PUBLIC (Continued).

		Years							
Grade	Actual 1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
7	195,626	191,200	190,600	191,700	186,600	185,200	180,700	169,300	168,600
8	192,116	193,300	188,900	188,300	189,400	184,400	183,000	178,500	167,300
9	188,544	191,300	192,500	188,100	187,500	188,600	183,600	182,200	177,800
Sub.	576,286	575,800	572,000	568,100	563,500	558,200	547,300	530,000	513,700
Diff.	+11,262	- 486	- 3,800	- 3,900	- 4,600	- 5,300	-10,900	-17,300	-16,300
10	181,723	187,600	190,400	191,600	187,200	186,600	187,700	182,700	181,300
11	163,688	167,300	172,700	175,300	176,400	172,300	171,800	172,800	168,200
12	144,786	149,600	152,900	157,800	160,200	161,200	157,400	157,000	157,900
Sub.	490,197	504,500	516,000	524,700	528,800	520,100	516,900	512,500	507,400
Diff.	+11,437	+14,303	+11,500	+ 8,700	- 900	- 3,700	- 3,200	- 4,400	- 5,100
7-12	1,066,483	1,080,300	1,088,000	1,092,800	1,087,300	1,078,300	1,064,200	1,042,500	1,021,100
Diff.	+22,699	+13,817	+ 7,700	+ 4,800	- 5,500	- 9,000	-14,100	-21,700	-21,400
K-12	2,385,627	2,375,900	2,358,100	2,332,400	2,308,600				
Other	68,325	70,000	70,000	70,000	70,000				
Total	2,453,952	2,445,900	2,428,100	2,402,400	2,378,600				
Diff.	- 6,493	- 8,052	-17,800	-25,700	-23,800				

Source: (54).

APPENDIX 4.--VOCATIONALLY CERTIFIED PERSONNEL IN MICHIGAN SECONDARY SCHOOLS: BY OCCUPATIONAL AREA BY TYPE OF CERTIFICATE

OCCUPATIONAL AREA	SEC. PROV.	SEC. PERM.	SPECIAL	LIFE	TOTAL
01.0000 AGRICULTURE TOTAL	64	141	0	5	210
04.0000 DISTRIBUTIVE EDUCATION TOTAL	218	103	0	0	321
04.0000 Distributive Education	216	0	0	0	216
04.0100 Advertising Services	2	0	0	0	2
07.0000 HEALTH OCCUPATIONS TOTAL	6	0	0	0	6
07.0000 Health Occupations	2	0	0	0	2
07.0300 Nursing	4	0	0	0	4
09.0000 HOME ECONOMICS TOTAL	740	482	3	41	1,266
09.0000 Home Economics	1	1	0	0	2
09.0100 Homemaking: Prep. for Pers., Home, & Fam. Living	693	473	0	41	1,207
09.0199 Homemaking, Other	0	0	1	0	1
09.0200 Occupational Preparation	13	4	0	0	17
09.0201 Care & Guid. Of Children	4	0	0	0	4
09.0202 Cloth. Man., Prod., & Serv.	5	0	0	0	5
09.0203 Food Man., Prod., & Serv.	23	4	2	0	29
09.0204 Home Furnish., Eqpmt., & Ser.	1	0	0	0	1
14.0000 OFFICE EDUCATION TOTAL	602	191	0	1	794
14.0000 Office Education	598	190	0	1	789
14.0102 Bookkeepers	1	0	0	0	1
14.0200 Bus. Data Proc. Syst. Occ.	3	1	0	0	4
17.0000 T&I OCCUPATIONS TOTAL	529	161	5	0	695
17.0000 T&I Occupations	0	0	0	0	0
17.0100 Air Conditioning	4	0	0	0	4
17.0300 Automotive Services	1	1	0	0	2
17.0301 Body & Fender	6	0	0	0	6
17.0302 Mechanics	97	23	1	0	121
17.0401 Aircraft Maintenance	3	2	0	0	5
17.0500 Blueprint Reading	3	0	0	0	3
17.0700 Commercial Art Occupations	2	0	0	0	2
17.1001 Carpentry	56	4	0	0	60
17.1002 Electricity	23	6	0	0	29
17.1003 Heavy Equipment, Const.	1	0	0	0	1
17.1004 Masonry	1	0	0	0	1
17.1005 Painting & Decorating	2	0	0	0	2
17.1007 Plumbing & Pipefitting	2	0	0	0	2
17.1100 Custodial Services	2	0	0	0	2
17.1300 Drafting	61	11	1	0	73
17.1401 Industrial Electrician	4	0	0	0	4
17.1500 Electronics Occupations	1	0	0	0	1
17.1501 Communications	2	0	0	0	2
17.1502 Industrial Electronics	5	1	0	0	6
17.1503 Radio/Television	2	1	0	0	3
17.1900 Graphic Arts Occupations	30	7	2	0	39
17.1901 Comp., Makeup & Typesetting	1	0	0	0	1
17.1902 Printing Press Occupations	9	4	0	0	13
17.1903 Lithog., Photo., & Platemkg.	0	2	0	0	2
17.2300 Metalworking	1	0	0	0	1
17.2301 Foundry	2	0	0	0	2
17.2302 Machine Shop	66	38	0	0	104
17.2303 Machine Tool Operation	7	2	0	0	9
17.2306 Welding & Cutting	20	9	1	0	30
17.2307 Tool & Die Making	1	1	0	0	2
17.2400 Metallurgy	1	1	0	0	2
17.2602 Cosmetology	1	0	0	0	1
17.2900 Quantity Food Occupations	3	1	0	0	4
17.3100 Small Eng. Repair, Int. Comb.	1	1	0	0	2
17.3302 Tailoring	1	0	0	0	1
17.3601 Millwork & Cabinet Making	3	3	0	0	6
17.7500 T&I Coordination	104	43	0	0	147
GRAND TOTAL	2,159	1,078	8	47	3,292

APPENDIX 5. DISTRIBUTION OF OCCUPATIONAL PERSONNEL BY MAJOR ACTIVITY PRIOR TO CURRENT POSITION OF EMPLOYMENT

Personnel Type	TOTAL	Non-teaching school employee	Teacher, private school	Teacher, secondary non-vocational	Teacher, secondary vocational	Teacher, post secondary, non-occupational	Teacher, post secondary, vocational occupational	Business, industry, agriculture	Social and personal services	Military service	Homemaking and non-wage earning	Student, degree with teacher education	Student, degree without teacher education	Student, comm. college occupational training	Student, private occupational school	Other
Full-Time																
Teacher	1324	118	31	106	154	15	105	373	42	20	39	188	65	20	6	42
Coop Coordinator/Teacher	165	14	3	16	23	2	9	49	5	1	4	23	5	4	1	6
Administrator/Supervisor	308	75	3	14	39	5	22	73	9	4	3	48	8	2	1	2
Consultant/Specialist	46	18	-	3	8	-	3	5	2	-	1	5	-	-	-	1
Personnel Services	31	9	1	2	1	-	-	7	1	1	-	8	-	-	-	1
Lab Tech/Paraprofessional	24	3	1	-	-	-	1	11	-	-	2	-	-	5	-	1
Other	67	10	1	3	7	1	4	24	5	-	-	4	2	-	-	1
Combination of Above	44	9	1	-	5	-	3	17	1	-	-	6	1	-	1	6
TOTAL	2009	256	41	144	237	23	147	559	65	26	49	282	81	31	9	59
PERCENTS BY ROW FROM THE ABOVE MATRIX																
Teacher		8.9	2.3	8.0	11.6	1.1	7.9	28.2	3.2	1.5	2.9	14.2	4.9	1.5	.5	3.2
Coop Coordinator/Teacher		8.5	1.8	9.7	13.9	1.2	5.5	29.7	3.0	.6	2.4	13.9	3.0	2.4	.6	3.6
Administrator/Supervisor		24.4	1.0	4.5	12.7	1.6	7.1	23.7	2.9	1.3	1.0	15.6	2.6	.6	.3	.6
Consultant/Specialist		39.1	-	6.5	17.4	-	6.5	10.7	4.3	-	2.2	10.9	-	-	-	2.2
Personnel Services		29.0	3.2	6.5	3.2	-	-	22.6	3.2	3.2	-	25.8	-	-	-	3.2
Lab Tech/Paraprofessional		12.5	4.2	-	-	-	4.2	45.8	-	-	8.3	-	-	20.8	-	4.2
Other		14.9	1.5	4.5	10.4	1.5	6.0	35.8	7.5	-	-	6.0	3.0	-	-	9.0
Combination of Above		20.5	2.3	-	11.4	-	6.8	38.6	2.3	-	-	13.6	2.3	-	2.3	-
TOTAL		12.7	2.0	7.2	11.8	1.1	7.3	27.8	3.2	1.3	2.4	14.0	4.0	1.5	.4	2.9
Part-Time																
Teacher	539	79	7	23	25	4	27	250	24	3	15	29	18	20	5	12
Coop Coordinator/Teacher	7	-	-	-	1	-	-	3	-	-	1	1	-	-	-	1
Administrator/Supervisor	6	1	-	-	1	-	-	1	1	-	-	1	-	-	1	-
Consultant/Specialist	5	-	-	1	-	-	-	2	-	-	-	2	-	-	-	-
Personnel Services	6	2	-	-	-	-	-	1	1	-	-	2	-	-	-	-
Lab Tech/Paraprofessional	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	30	3	-	2	-	-	1	13	1	-	5	2	-	-	-	3
Combination of Above	16	-	-	-	1	-	3	5	1	1	-	1	1	1	-	2
TOTAL	609	85	7	26	26	4	31	275	28	4	21	38	19	21	6	18
PERCENTS BY ROW FROM THE ABOVE MATRIX																
Teacher		14.7	1.3	4.3	4.3	.7	5.0	46.4	4.5	.6	2.8	5.4	3.3	3.7	.9	2.2
Coop Coordinator/Teacher		-	-	-	14.3	-	-	42.9	-	-	14.3	14.3	-	-	-	14.3
Administrator/Supervisor		16.7	-	-	16.7	-	-	16.7	16.7	-	-	16.7	-	-	16.7	-
Consultant/Specialist		-	-	20.0	-	-	-	40.0	-	-	-	40.0	-	-	-	-
Personnel Services		33.3	-	-	-	-	-	16.7	16.7	-	-	33.3	-	-	-	-
Lab Tech/Paraprofessional		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other		10.0	-	6.7	-	-	3.3	43.3	3.3	-	16.7	6.7	-	-	-	10.0
Combination of Above		-	-	-	6.3	-	18.8	31.3	6.3	6.3	-	6.3	6.3	6.3	-	12.5
TOTAL		14.0	1.1	4.3	4.3	.7	5.1	45.2	4.6	.7	3.4	6.2	3.1	3.4	1.0	3.0

APPENDIX 6. NUMBER OF OCCUPATIONAL PERSONNEL RECRUITED FROM OUT-OF-STATE

Personnel Type	Full-Time			Part-Time		
	TOTAL	Yes	No	TOTAL	Yes	No
Teacher	883	124	759	373	10	363
Coop Coordinator/Teacher	95	9	86	6	-	6
Administrator/Supervisor	182	33	149	3	-	3
Consultant/Specialist	37	7	30	4	-	4
Personnel Services	17	2	15	2	-	2
Lab Tech/Paraprofessional	15	-	15	-	-	-
Other	54	6	48	21	-	21
Combination of Above	28	3	25	10	-	10
TOTAL	1311	184	1127	419	10	409
PERCENTS BY ROW FROM THE ABOVE MATRIX						
Teacher		14.0	86.0		2.7	97.3
Coop Coordinator/Teacher		9.5	90.5		-	100.0
Administrator/Supervisor		18.1	81.9		-	100.0
Consultant/Specialist		18.9	81.1		-	100.0
Personnel Services		11.8	88.2		-	100.0
Lab Tech/Paraprofessional		-	100.0		-	-
Other		11.1	88.9		-	100.0
Combination of Above		10.7	89.3		-	100.0
TOTAL		14.0	86.0		2.4	97.6

APPENDIX 7. NUMBER OF OCCUPATIONAL PERSONNEL WHO RETURNED TO EMPLOYMENT IN EDUCATION

Personnel Type	Full-Time			Part-Time		
	TOTAL	Yes	No	TOTAL	Yes	No
Teacher	883	138	745	369	41	328
Coop Coordinator/Teacher	95	13	82	6	2	4
Administrator/Supervisor	179	23	156	3	-	3
Consultant/Specialist	35	2	33	4	-	4
Personnel Services	17	2	15	2	-	2
Lab Tech/Paraprofessional	15	1	14	-	-	-
Other	51	1	50	21	1	20
Combination of Above	28	4	24	10	1	9
TOTAL	1303	184	1119	415	45	370
PERCENTS BY ROW FROM THE ABOVE MATRIX						
Teacher		15.6	84.4		11.1	88.9
Coop Coordinator/Teacher		13.7	86.3		33.3	66.7
Administrator/Supervisor		12.8	87.2		-	100.0
Consultant/Specialist		5.7	94.3		-	100.0
Personnel Services		11.8	88.2		-	100.0
Lab Tech/Paraprofessional		6.7	93.3		-	-
Other		2.0	98.0		4.8	95.2
Combination of Above		14.3	85.7		10.0	90.0
TOTAL		14.1	85.9		10.8	89.2

APPENDIX 8.--NUMBER COMPLETING STATE PLAN REQUIREMENTS FOR VOCATIONAL TEACHING CERTIFICATE BY INSTITUTION & OCCUPATIONAL AREA, 1970

Public Institution	01 Agriculture			04 D.E.			09 Home Ec			14 O.E.			16 & 17 Tech. & Trade			TOTAL		
	Preservice	Inservice	TOTAL	Preservice	Inservice	TOTAL	Preservice	Inservice	TOTAL	Preservice	Inservice	TOTAL	Preservice	Inservice	TOTAL	Preservice	Inservice	TOTAL
C.M.U.	--	--	--	16	5	21	38	0	38	22	6	28	Approved in '70			76	11	87
E.M.U.	--	--	--	13	5	18	41	8	49	27	8	35	8	10	18	89	31	120
F.S.C.	--	--	--	15	0	15	--	--	--	25	0	25	58	25	83	98	25	123
M.S.U.	34	13	47	9	6	15	110	38	148	5	19	24	17	22	39	175	98	273
N.M.U.	--	--	--	14	2	16	21	13	34	4	6	10	5	4	9	44	25	69
U.M.	--	--	--	--	--	--	--	--	--	--	--	--	0	12	12	0	12	12
W.S.U	--	--	--	25	0	25	34	9	43	47	0	47	13	15	28	119	24	143
W.M.U.	--	--	--	19	0	19	63	7	70	235	16	251	15	22	37	332	45	377
TOTAL	34	13	47	111	18	129	307	75	382	365	55	420	116	110	226	933	271	1204

Source: Institutional Annual Reports to Department of Education, Vocational Education Services.

APPENDIX 9.--BACHELOR'S, MASTER'S AND DOCTOR'S DEGREES GRANTED, BY MAJOR FIELD AND AREA OF STUDY, 1967-68, 1968-69, 1969-70

	1967-68									1968-69									1969-70								
	Bachelor's			Master's			Doctor's			Bachelor's			Master's			Doctor's			Bachelor's			Master's			Doctor's		
	M	W	T	M	W	T	M	W	T	M	W	T	M	W	T	M	W	T	M	W	T	M	W	T	M	W	T
Agricultural Education	31.5		31.5	21	3	24	4		4	10	1	11	23		23	3		3	24	1	25	15	2	17	7		7
Public Colleges & Univ.	31		31	21	3	24	4		4	10	1	11	23		23	3		3	24	1	25	15	2	17	7		7
Michigan State University	30		30	21	3	24	4		4	9		9	23		23	3		3	21	1	22	15	2	17	7		7
Western Michigan Univ.	1		1							1	1	2							3		3						
Nonpublic Colleges & Univ.	.5		.5																								
Andrews University	.5		.5																								
Business Ed., Commercial Ed.	149	191	340	31	42	73				178	240	418	30	61	91				261	275	536	39	57	96			
Public Colleges & Univ.	149	182	331	29	35	64				176	236	412	28	50	78				258	271	529	37	53	92			
Central Michigan Univ.	22	21	43							23	26	49							30	28	58						
Eastern Michigan Univ.	13	26	39	2	1	3				21	31	52	3	1	4				43	37	80	1	4	5			
Ferris State College	41	20	61							32	19	51							41	26	67						
Michigan State Univ.	9	20	29							17	31	48							18	31	49						
Northern Michigan Univ.	23	19	42	11	4	15				29	19	48	2	1	3				32	20	52	10	2	12			
University of Michigan	4	6	10							2		2															
Wayne State University	2	13	15	11	20	31				10	34	44	13	33	46				7	34	41	16	30	48			
Western Michigan Univ.	35	57	92	5	10	15				42	76	118	10	15	25				87	95	182	10	17	27			
Nonpublic Colleges & Univ.		9	9	2	7	9				2	4	6	2	11	13				3	4	7	2	4	6			
Adrian										2		2							3		3						
Marygrove College		1	1																								
University of Detroit		8	8	2	7	9					4	4	2	11	13					4	4	2	4	6			
Distributive Ed., Retail Sell	11	2	13	25	13	38	4	2	6	13	1	14	29	16	45	2	2	4	33	7	40	30	22	52	4		4
Public Colleges & Univ.	11	2	13	25	13	38	4	2	6	13	1	14	29	16	45	2	2	4	33	7	40	30	22	52	4		4
Ferris State College																			15	1	16						
Michigan State Univ.				20	13	33	4	2	6				12	13	25	2	2	4				17	19	36	4		4
Wayne State University	3		3	4		4				5	1	6	12	2	14				4	4	8	12	2	14			
Western Michigan Univ.	8	2	10	1		1				8		8	5	1	6				14	2	16	1	1	2			
Home Economics Education	1	214	215		33	33		1	1	2	252	254		49	49		2	2		311	311		37	37		1	1
Public Colleges & Univ.	1	193	194		33	33		1	1	2	220	222		49	49		2	2		281	281		37	37		1	1
Central Michigan Univ.	1	20	21		4	4				1	20	21		4	4					39	39						
Eastern Michigan Univ.		11	11								18	18		15	15					31	31		10	10			
Michigan State Univ.		87	87		12	12		1	1		73	73		19	19		2	2		103	103		11	11		1	1
Northern Michigan Univ.		7	7		3	3					19	19		3	3								4	4			
Wayne State Univ.		23	23		8	8				1	28	29		5	5					34	34		7	7			
Western Michigan Univ.		45	45		6	6					62	62		3	3					74	74		5	5			
Nonpublic Colleges & Univ.		21	21								32	32								30	30						
Adrian											10	10								5	5						
Andrews University		8	8								12	12								9	9						
Marygrove College		3	3								3	3								3	3						
Mercy College of Detroit		8	8																								
Nazareth		2	2								7	7															
Sienna Heights College																				13	13						
Health Ed., Sep. Curriculum		4	4								4	4							5	10	15	2	3	5			
Public Colleges and Univ.		4	4								4	4							5	10	15	2	3	5			
Central Michigan Univ.																			4	4	8	2	3	5			
Michigan State Univ.		3	3								4	4								2	2						
University of Michigan		1	1																1	4	5						
Western Michigan Univ.																											
Industrial Arts Ed., Nonvoc.	367	362	729	93	1	94	2		2	197	2	199	156	1	157	5		5	237	4	241	160		160	5		5
Public Colleges & Univ.	367	362	729	93	1	94	2		2	197	2	199	156	1	157	5		5	237	4	241	160		160	5		5
Central Michigan Univ.										44		44	4		4				45		45	6		6			
Eastern Michigan Univ.	31		31	20		20				29		29	43		43				42		42	37		37			
Michigan State Univ.	25		25	14		14	2		2	27	1	28	25		25	1		1	26	1	27	23		23	2		2
Northern Michigan Univ.	46		46	9		9				50		50	5		5				65		65	10		10			
University of Michigan	1		1							1		1															
Wayne State University	34	2	36	50	1	51				33	1	34	58	1	59	4		4	45	3	48	67	1	68	3		3
Western Michigan Univ.	230	360	590							13		13	21		21				14		14	20		20			
Trade or Ind. Ed., Voc.	89.5	2	91.5	3		3				94	2	96	2		2				131	1	132	1		1			
Public Colleges & Univ.	86	1	87	3		3				94	2	96	2		2				131	1	132	1		1			
Ferris State College	40		40							53		53							57		57						
University of Michigan	20		20																								
Wayne State University				3		3							2		2							1		1			
Western Michigan Univ.	26	1	27							41	2	43							74	1	75						
Nonpublic Colleges & Univ.	3.5	1	4.5																								
Andrews University	3.5	1	4.5																								

Source: Higher Education General Information Survey, Michigan Department of Education.

APPENDIX 10. VOCATIONAL-TECHNICAL AND PRACTICAL ARTS INITIAL CERTIFICATION OUTPUTS BY INSTITUTION, 1966/67-1974/75.

Initial Certification via BA/BS Degree Route & Post BA/BS Route	Past Outputs - Completions				Current Enrollments	Anticipated Outputs				
	66/67	67/68	68/69	69/70	Total Active Majors	70/71	71/72	72/73	73/74	74/75
Central Michigan University Vocational Certification[a]										
Business	20	30	44	75	320	112	126	136	162	180
Home Economics	25	20	32	40	62	42	50	55	60	60
Industrial	0	0	0	8	40	21	26	32	38	42
TOTAL	45	50	76	123	422	175	202	223	260	282
Central Michigan University General (Only) Certification										
Business	20	15	40	25	80[b]	22	23	33	35	46
Home Economics	--[b]	--[b]	--[b]	1	--[b]	0	0	0	0	0
Industrial	35	40	70	99	264	104	94	105	121	132
TOTAL	55[f]	55[f]	110[f]	125	344[f]	126	117	138	156	178
Eastern Michigan University Vocational Certification[a]										
Business	26	33	45	64	--[b]	76	79	66	64	64
Home Economics	38	37	49	46	288	59	75	88	97	110
Industrial	11	10	18	18	--[b]	22	23	23	23	23
TOTAL	75	80	112	128	288[f]	157	177	177	184	197
Eastern Michigan University General (Only) Certification										
Business	23	31	38	61	--[b]	56	44	41	39	36
Home Economics	2	4	2	6	29	12	15	20	25	30
Industrial	22	28	20	25	--[b]	30	30	30	30	30
TOTAL	47	63	60	92	29[f]	98	89	91	94	96
Ferris State College Vocational Certification[a]										
Business	20	30	25	35	155	40	45	45	50	50
Trade & Technical	27	40	61	64	200	70	76	83	91	100
TOTAL	47	70	86	99	355	110	121	128	141	150
Ferris State College General (Only) Certification										
Business	23	33	25	35	155	45	45	50	50	55
Michigan State University Vocational Certification[a]										
Agriculture	30	31	25	34	44	24	17	12	17	22
Business	40	39	42	68	132	108	109	103	133	133
Home Economics	88	89	80	110	91	110	100	95	90	90
Industrial	4	5	4	3	4	9	9	9	9	9
TOTAL	162	164	151	215	271	251	235	219	249	254
Michigan State University General (Only) Certification										
Business	98	81	59	59	44	34	17	20	15	15
Industrial	12	22	21	29	144	29	34	34	34	34
TOTAL	110	103	80	88	188	63	51	54	49	49
Northern Michigan University Vocational Certification[a]										
Business	--	--	--	1	64	15	74	79	86	92
Home Economics	17	7	17	28	215	25	31	35	40	45
Industrial	12	9	8	13	--[j]	17	19	20	29	34
TOTAL	29	16	25	42	64[f]	57	124	134	155	171

APPENDIX 10. Continued.

Initial Certification via BA/BS Degree Route & Post BA/BS Route	Past Outputs - Completions				Current Enrollments	Anticipated Outputs				
	66/67	67/68	68/69	69/70	Total Active Majors	70/71	71/72	72/73	73/74	74/75
Northern Michigan University										
General (Only) Certification										
Business	42	57	64	64	56	53	--[g]	--[g]	--[g]	--[g]
Home Economics	0	0	1	0	0	0	0	0	0	0
Industrial	30	44	51	67	--[b]	79	81	81	87	87
TOTAL	72	101	116	131	56[f]	132	81	81	87	87
University of Michigan										
Vocational Certification[a]										
Business	9[c]	22[c]	16[c]	12[c]	--[b]	5[c]	--[b]	8	16	16
Industrial	3[c]	4[c]	--[b]	--[b]	--[b]	--[b]	--[b]	17[h]	34[i]	34[i]
TOTAL	12[c]	26[c]	16[f]	12[f]	--[f]	5[f]	--[f]	25[h]	50[i]	50[i]
Wayne State University										
Vocational Certification[a]										
Business	NA[d]	135[e]	496	257	679	275	230	295	300	315
Home Economics	15	22	33	40	204	43	64	55	58	57
Industrial	16	22	26	33	280	55	64	75	88	102
TOTAL	31[f]	179[f]	555	330	1163	373	408	425	446	474
Wayne State University										
General (Only) Certification										
Home Economics	0	4	2	0	0	0	0	0	0	0
Industrial	11	12	12	12	97	19	22	27	31	37
TOTAL	11	16	14	12	97	19	22	27	31	37
Western Michigan University										
Vocational Certification[a]										
Business	71	95	143	206	--[b]	263	293	295	287	291
Home Economics	53	59	90	94	314	120	121	127	128	129
Industrial	21	26	32	27	--[b]	33	40	46	53	60
TOTAL	145	180	265	327	314[f]	416	454	468	468	480
Western Michigan University										
General (Only) Certification										
Agriculture	1	2	2	2	18	3	3	4	4	4
Business	37	42	47	32	--[b]	27	15	0	0	0
Industrial	67	63	93	121	--[b]	148	149	155	162	219
TOTAL	105	107	142	155	18[f]	178	167	159	166	223

[a] Includes those gaining Vocational Certification and those qualifying for both Vocational and General Provisional Certification.

[b] Data not reported by institution.

[c] From Annual NEA Teacher Supply & Demand Data.

[d] Reported by institution as NA.

[e] Incomplete - Lacks Post BA/BS Route Outputs.

[f] Total incomplete due to the above.

[g] Curriculum changes to Dual Certification.

[h] Includes Health Occupations (7).

[i] Includes Health Occupations (14).

[j] Incomplete - Lacks BA/BS Route.

APPENDIX 11. INSTITUTIONAL GRADUATE OUTPUTS, BY DEGREES, 1967/69-1971/75.

Higher Degree Programs	Past Outputs - Completions			Current Enrollments	Anticipated Outputs				
	67/68	68/69	69/70	Total Active[a]	70/71	71/72	72/73	73/74	74/75
Central Michigan University									
Master's									
Business	5	5	5	80	10	15	20	25	30
Home Economics	4	6	3	20	4	4	4	5	6
Industrial	10	20	31	29	33	35	55	59	70
Master's TOTAL	19	31	39	129	47	54	79	89	106
Specialist									
Industrial	0	1	1	2	2	2	2	2	2
Specialist TOTAL	0	1	1	2	2	2	2	2	2
Central TOTAL	19	32	40	131	49	56	81	91	108
Eastern Michigan University									
Master's									
Business	3	3	5	21	9	11	15	16	18
Home Economics	17	15	18	118	20	25	30	35	40
Industrial	20	43	48	250	45	45	45	45	45
Master's TOTAL	40	61	71	349	74	81	90	96	103
Specialist									
Industrial	0	0	1	30	Being Discontinued				
Specialist TOTAL	0	0	1	30	Being Discontinued				
Eastern TOTAL	40	61	72	419	74	81	90	96	103
Michigan State University									
Master's									
Agriculture	24	23	8	103	15	20	15	20	15
Business	25	25	35	--[b]	35	35	35	35	35
Home Economics	12	19	10	50	8	9	9	9	9
Industrial	22	25	24	171	25	25	25	25	25
Master's TOTAL	83	92	77	324[c]	83	89	84	89	84
Specialist									
Agriculture	0	0	0	2	0	1	0	1	0
Business	1	2	2	--[b]	2	4	4	4	4
Home Economics	0	0	0	0	1	0	0	0	0
Industrial	0	0	0	5	1	2	2	2	3
Common	0	0	0	7	2	3	4	4	4
Specialist TOTAL	1	2	2	14[c]	6	10	10	11	11
Doctoral									
Agriculture	4	3	5	12	3	4	3	3	3
Business	6	5	8	--[b]	14	13	8	8	15
Home Economics	1	2	3	4	2	2	1	1	1
Industrial	1	1	1	36	4	4	4	4	4
Common	1	1	1	8	3	2	8	10	8
Doctoral TOTAL	13	12	18	60[c]	26	25	24	26	31
Michigan State TOTAL	97	106	97	398[c]	115	124	118	126	126
Northern Michigan University									
Master's									
Business	15	14	13	18	15	18	21	24	27
Home Economics	3	3	6	6	5	5	5	5	5
Industrial	9	5	23	164	12	15	18	18	24
Master's TOTAL	27	22	42	188	32	38	44	47	56
Northern TOTAL	27	22	42	188	32	38	44	47	56

APPENDIX 11. Continued.

Higher Degree Programs	Past Outputs - Completions			Current Enrollments	Anticipated Outputs				
	67/68	68/69	69/70	Total Active[a]	70/71	71/72	72/73	73/74	74/75
University of Michigan									
Master's									
Occupational Education	11	13	15	125	15	25	35	45	55
Master's TOTAL	11	13	15	125	15	25	35	45	55
Specialist									
Occupational Education	0	0	2	10	2	10	20	30	40
Specialist TOTAL	0	0	2	10	2	10	20	30	40
Doctoral									
Occupational Education	1	0	1	10	2	3	6	8	8
Doctoral TOTAL	1	0	1	10	2	3	6	8	8
University of Michigan TOTAL	12	13	18	145	19	38	61	83	103
Wayne State University									
Master's									
Business	35	60	70	350	80	90	100	110	120
Home Economics	8	5	8	74	6	8	10	10	12
Industrial	54	61	57	138	28	35	43	52	57
Master's TOTAL	97	126	135	562	114	133	153	172	189
Specialist									
Business	1	1	2	20	3	4	5	6	7
Industrial	2	2	2	12	3	6	9	12	15
Specialist TOTAL	3	3	4	32	6	10	14	18	22
Doctoral									
Business	3	4	6	18	4	7	9	11	13
Industrial	0	4	3	14	5	5	5	4	3
Doctoral TOTAL	3	8	9	32	9	12	14	15	16
Wayne TOTAL	103	137	148	626	129	155	181	205	227
Western Michigan University									
Master's									
Business	16	32	39	327	49	54	56	57	59
Home Economics	11	3	10	156	24	32	34	36	38
Industrial	27	21	29	234	30	35	35	40	40
Master's TOTAL	54	56	78	717	103	121	125	133	137
Specialist									
Business	0	0	1	19	2	3	3	3	3
Home Economics	0	0	0	0	0	0	4	4	6
Specialist TOTAL	0	0	1	19	2	3	7	7	9
Western TOTAL	54	56	79	736	105	124	132	140	146

[a]Active = Enrolled once (or more) during past year.

[b]Report incomplete.

[c]Total incomplete due to above.

APPENDIX 12.--ANTICIPATED NEED FOR VOCATIONAL-TECHNICAL EDUCATION TEACHERS IN MICHIGAN K-12 SCHOOL DISTRICTS AND COMMUNITY COLLEGES

Teachers for	Number Employed Now		Number Additional Needed Now		Additional Number Needed for New Programs or Expansion			
	K-12	C. C.	K-12	C. C.	K-12	C. C.	K-12	C. C.
Agricultural Occupations	86	2	6	2	12	2	65	5
Office Occupations	777	57	45	4	111	24	295	61
Distributive Occupations	127	7	21	2	58	9	253	26
Home Economics and Related Occupations	967	0	34	1	71	0	267	10
Industrial Occupations	753	205	84	11	188	41	405	102
Food Service Occupations	115	3	9	0	39	4	107	22
Health Service Occupations	60	59	16	6	20	30	67	82
Public Service Occupations	5	3	1	1	13	4	46	15
Tourist and Resort Occupations	0	0	44	0	4	0	31	3
Other: Management Development	0	33	0	4	0	4	0	0
SubTotal	2,890	369	260	31	516	118	1,536	326
Grand Total	3,259		291		634		1,862	

Source: Michigan Department of Education, Vocational Education Services, 1965.

APPENDIX 13.--SECONDARY PERSONNEL DEMAND BY SPECIALIZATIONS ACCORDING TO FIFTY-FOUR LOCAL SCHOOL DISTRICT VOCATIONAL DIRECTORS 1970/71-1975/76

Teachers	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL[c]
01 Agriculture-Unspecified	--	--	--	1	--	--	--	1
Sod & Turf	--	--	1	--	--	--	--	1
Urban Agric. Production	--	--	--	--	--	--	1	1
03 Business-Unspecified[d]	17	14	--	2	2	--	1	36
04 Distributive-Unspecified	5	1	3	3	--	--	4	16
07 Health-Unspecified	--	3	2	--	--	--	--	5
Health (Patient Care)	--	--	1	--	--	--	--	1
Health Education	--	--	--	1	--	--	--	1
Medical Assistant	--	--	1	--	--	--	--	1
Nurse's Aid	1	--	--	--	1	--	--	2
Nursing	--	--	1	--	--	--	--	1
09 Home Ec-Unspecified	10	5	4	3	2	--	3	27
Child Care	1	2	1	--	--	1	1	6
Consumer Education	--	1	--	1	--	--	--	2
Food Service	7	2	1	1	--	1	1	13
Wage-Earning Unspecified	10	--	--	--	--	--	1	11
14 Office-Unspecified	--	2	4	3	--	--	2	11
Data Processing	1	--	--	--	--	--	--	1
Integrated Office	--	--	--	1	--	--	--	1
Model Office	--	--	--	--	--	--	1	1
17 Trade & Industry-Unspecified	2	7	4	4	1	1	--	19
Appliance Repair	--	--	1	--	--	--	2	3
Office Machine Repair	--	--	--	--	--	--	1	1
Auto Body	2	1	1	1	--	1	1	7
Auto Mechanics/Service	3	6	1	2	--	--	1	13
Power Mechanics	--	1	1	1	--	--	--	3
Small Engine	--	--	--	--	--	1	1	2
Service Station Operators	--	--	--	1	--	--	--	1
Building Trades	6	3	1	2	--	--	--	12
Carpentry	--	1	1	--	--	--	--	2
Pre-Voc. Building Trades	--	--	1	--	--	--	--	1
Building Maintenance	--	1	1	--	--	--	1	3
Building & Grounds Maint.	2	--	--	--	--	--	--	2
Commercial Art	--	1	--	--	--	--	--	1
Cosmetology	1	2	--	1	--	--	--	4
Drafting	2	--	--	--	--	--	1	3
Electricity/Electronics	--	2	--	1	--	--	--	3
Electricity	1	--	1	--	--	--	--	2
Electronics	2	2	1	--	--	--	1	5
Radio & TV	--	1	--	--	--	--	--	1
Fluid Power	--	--	--	--	--	1	1	2
Graphics/Printing	4	2	2	--	--	--	2	10
Photography	--	1	--	--	--	--	--	1
Heating, Air Cond., Refrig.	--	1	--	--	--	--	1	2
Machine Tool Shop	1	1	--	--	--	--	--	2
Manufacturing Processes	--	--	1	--	--	--	--	1
Metal Fabrication	--	1	--	--	--	--	--	1
Metal Technology	--	--	--	--	--	1	--	1
Model & Pattern Making	--	--	2	--	--	--	--	2
Welding	2	2	1	--	--	1	--	6
Related Science	--	--	1	--	--	--	--	1
Teachers-Special Needs								
Disadvantaged & Handi. Instr.	7	6	--	--	--	--	1	14
Elementary Career Couns. Teach.	9	--	--	--	--	--	--	9
Teachers-Miscellaneous	--	--	4	--	--	--	6	10

[a]Record of actual hirings by fifty-four districts.

[b]Some respondents preferred to specify their staff needs after 1971/72 in a four year block.

[c]Total given is by each specialization over the six year period. See Table IV-H[68] for sub totals and totals by year.

[d]Category used to designate Business hirings with specialization undefined. Classification listed in Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook VI, United States Office of Education, OE-23052, 1970.

APPENDIX 14.--SECONDARY AREA VOCATIONAL CENTER PERSONNEL DEMAND BY SPECIALIZATIONS ACCORDING TO TWENTY-TWO HEAD ADMINISTRATIVE OFFICERS 1970/71-1975/76

Teachers	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL[c]
01 Agriculture-Unspecified	--	--	--	1	--	--	--	1
Agri-Mechanics	2	--	2	--	--	--	--	4
Agri-Related	--	--	1	--	--	--	--	1
Floral Arrangements	--	1	--	--	--	--	--	1
Greenhouse & Nursery	--	2	--	--	--	--	--	2
Landscape Hort.-Nursery	1	2	2	--	--	--	--	5
Produce & Plant Operations	--	--	--	--	1	--	--	1
Retail Plant Sales	--	2	--	--	--	--	--	2
04 Distributive-Unspecified	4	2	7	1	--	--	--	14
Advertisising	--	1	--	--	--	--	--	1
Display	1	1	--	--	--	--	--	2
Retail Sales	--	--	1	--	--	--	--	1
Retail & Marketing	1	--	1	--	--	--	--	2
07 Health-Unspecified	9	2	3	1	--	--	--	15
Dental Assistant	1	4	1	--	--	--	1	7
Health Care Aide	--	--	1	--	--	--	--	1
Histology Technician	--	--	1	--	--	--	--	1
L.P.N.	--	1	1	--	--	--	--	2
Medical Assistant	1	4	1	--	--	--	--	6
Nurse	--	2	--	--	--	--	--	2
Operating Room Technician	--	--	1	--	--	--	--	1
09 Home Ec-Unspecified	--	2	--	--	--	--	--	2
Commercial Food Service	1	4	1	--	--	--	--	6
Food Service, Waitress, Etc.	5	2	3	--	--	--	1	11
Baker	--	1	--	--	--	--	--	1
Chef/Cook	--	1	--	--	--	--	1	2
Hospitality	--	--	1	--	--	--	1	2
Child Care	3	2	2	1	--	--	--	8
Homemaker Aide	--	--	1	--	--	--	--	1
Instit. & Domestic Services	1	--	--	--	--	--	--	1
Housekeeping Aide-Motel	--	--	1	--	--	--	--	1
Needle Trades	--	--	1	--	--	--	1	2
Clothing Construction	--	--	1	--	--	--	--	1
Clothing Service	2	--	1	--	--	--	--	3
Tailor/Seamstress	--	1	--	--	--	--	--	1
14 Office-Unspecified	3	1	6	--	--	--	--	10
Accountant Bookkeeping	--	--	2	--	--	--	--	2
Data Processing	3	1	6	1	--	--	--	11
General Clerical	--	--	1	--	--	--	--	1
General Office Machines	--	--	1	--	--	--	--	1
Office Communications	--	--	1	--	--	--	--	1
Steno-Secretarial	1	--	2	--	--	--	--	3
Total Office Practice	1	--	1	--	--	--	--	2

APPENDIX 14. Continued

Teachers	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL[c]
17 Trade & Industry								
Appliance Repair	2	3	3	--	--	--	--	8
Fluid Power	--	2	--	--	--	--	--	2
Office Machine Service	--	--	4	--	--	--	--	4
Heat., Air., Vent., & Refrig.	3	6	5	1	--	--	1	16
Auto Body	3	6	3	1	--	--	1	14
Auto Mechanics/Service	3	12	4	2	--	--	--	21
Diesel Mechanics	--	2	1	--	--	--	--	3
Marine Mechanics	--	1	--	--	--	--	--	1
Small Engine & Rec. Equip.	1	--	4	--	--	--	1	6
Heavy Equipment	--	--	1	--	--	--	1	2
Industrial Mechanics	--	1	--	--	--	--	--	1
Res. Constr. Bldg. Trades	11	6	7	--	--	--	--	24
Electrical Wiring	--	--	1	--	--	--	--	1
Furniture & Cabinet	--	1	--	1	--	--	--	2
Printing & Decorating	--	--	1	--	--	--	--	1
Plumbing	--	--	--	--	--	--	1	1
Building Maintenance	1	1	4	--	--	--	--	6
Cosmetology	3	7	4	1	--	--	--	15
Drafting	5	2	2	1	--	--	1	11
Drafting-Architectural	--	2	1	--	--	--	--	3
Drafting-Engineering	--	2	2	--	--	--	--	4
Electrical Occupations	2	--	1	1	--	--	--	4
Electricity/Electronics	1	--	--	--	--	--	--	1
Electronics	2	--	2	--	--	--	1	5
Industrial Electricity	1	1	1	--	--	--	--	3
Industrial Electronics	--	2	--	--	--	--	--	2
Radio & TV Repair	2	1	1	--	--	--	--	4
Graphics/Printing	3	3	3	1	--	--	1	11
Commercial Art	2	4	--	--	--	--	1	7
Machine Tool Shop	3	3	7	--	--	--	--	13
Materials Fabrication	1	--	--	--	--	--	--	1
Sheet Metal	--	1	--	--	--	--	--	1
Welding	1	3	5	--	--	--	--	9
Teachers-Special Needs	--	--	1	--	--	--	--	1

[a]Record of actual hirings.

[b]Some respondents preferred to specify their staff needs after 1971/72 in a four year block.

[c]Total given is by each specialization over the six year period. See Table IV-I (69) for sub totals and totals by year.

APPENDIX 15.--POST-SECONDARY PERSONNEL DEMAND BY SPECIALIZATIONS ACCORDING TO TWENTY-NINE COMMUNITY COLLEGE OCCUPATIONAL EDUCATION DEANS 1970/71-1975/76

Teachers	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL[c]
01 Agriculture-Unspecified	--	1	--	1	--	--	--	2
Agri-Business	--	1	--	--	--	--	--	1
Natural Resources	1	1	1	--	--	--	--	3
03 Business-Unspecified[d]	2	--	2	2	2	2	12	22
04 Distributive-Unspecified	--	1	--	--	1	--	1	3
Marketing	--	2	--	--	--	--	--	2
Management	--	1	--	--	--	--	1	2
General Business Admin.	1	--	--	--	--	--	1	2
Hosp.-Hotel/Motel Mgmt.	--	1	1	1	--	--	--	3
Retail Accounting	--	1	--	--	--	--	--	1
Recreation & Parks	--	--	--	--	1	--	1	2
07 Health-Unspecified	10	4	1	1	3	1	25	45
Medical Lab	--	2	1	--	--	--	1	4
Dental Assistant	--	3	--	--	--	--	2	5
Dental Hygiene	1	3	--	--	--	--	--	4
L.P.N.	5	8	--	--	--	--	5	18
Nursing R.N. (Assoc. Deg.)	4	17	1	--	--	--	4	26
Physical Therapy	--	1	--	--	--	--	1	2
Inhalation Therapy	--	1	--	--	--	--	--	1
Hospital Ward Management	--	1	--	--	--	--	1	2
X-Ray Technician	--	--	--	--	--	--	1	1
Advisement Specialist	--	--	1	--	--	--	--	1
Psychiatric Technician	--	1	1	--	--	--	1	3
Operating Room Technician	--	--	--	--	--	--	1	1
Physician's Assistant	--	--	--	--	--	--	1	1
09 Home Ec-Unspecified	--	--	--	--	2	--	--	2
Food Management	--	1	--	--	--	--	--	1
Commercial Food Service	--	--	1	--	--	--	2	3
Dietetic Aide	--	--	--	--	--	--	1	1
Child Care	--	--	1	--	--	--	--	1
14 Office-Unspecified	1	1	--	--	2	--	4	8
Data Processing	4	4	--	--	--	--	4	12
General Business	1	2	--	--	--	--	1	4
Secretarial	1	1	--	--	--	--	2	4
Court Reporter & Gen. Sec.	1	--	--	--	--	--	--	1
Sec. & Commercial Accountant	1	--	--	--	--	--	--	1
Teacher Assistant	--	--	1	--	--	--	--	1
16 & 17 Tech & Trade-Unspecified	1	--	4	4	6	2	14	31
Aviation/Avionics	--	--	2	1	--	--	--	3
Automotive Mechanics	4	2	2	--	--	--	5	13
Body Repair	--	--	3	--	--	--	--	3
Diesel	--	--	2	--	--	--	--	2
Small Engine	--	--	1	--	--	--	1	2
Heavy Equipment	--	--	1	--	--	--	--	1
Appliance Repair	--	--	--	--	--	--	1	1
Heat., Air., Vent., & Refrig.	3	1	--	--	--	--	1	5
Drafting	1	1	1	--	--	--	1	4
Drafting-Architectural	--	1	--	--	--	--	--	1

APPENDIX 15. Continued

Teachers	70/71[a]	71/72	72/73	73/74	74/75	75/76	72-75[b]	TOTAL[c]
Graphics/Printing	--	3	--	--	--	--	1	4
Electricity/Electronics	1	5	1	--	--	--	3	10
Electronics	1	--	--	--	--	--	2	3
Electronics-Logic Circuitry	--	1	--	--	--	--	--	1
Radio & TV Repair	--	--	--	--	--	--	2	2
Electrical	1	--	--	--	--	--	--	1
Res. Const. Bldg. Trades	--	2	2	1	--	--	1	6
Materials Testing & Constr.	--	--	--	--	--	--	1	1
Custodial	--	--	--	1	--	--	--	1
Machine Shop	--	--	1	--	--	--	3	4
Welding	--	2	2	--	--	--	3	7
Industrial Technology	1	--	--	--	--	--	--	1
Casting	--	1	--	--	--	--	1	2
Manufacturing Engineering	--	1	--	--	--	--	--	1
Mechanical Technology	--	2	--	--	--	--	2	4
Civil Survey	--	--	1	--	--	--	--	1
Farrier (Horseshoeing)	--	--	--	--	--	--	1	1
Apprentice	1	2	--	--	--	--	--	3
Cosmetology	1	1	--	--	--	--	1	3
Law Enforcement	3	6	--	1	--	--	2	12
Sanitation & Water	1	1	1	--	--	--	1	4
Community & Public Service	1	--	1	1	1	--	1	5

[a]Record of actual hirings.

[b]Some respondents preferred to specify their staff needs after 1971/72 in a four year block.

[c]Total given is by each specialization over the six year period. See Table ____ for sub totals and totals by year.

[d]Category used to designate Business hirings with specialization undefined. Classification listed in Standard Terminology for Curriculum and Instruction in Local and State School Systems, Handbook Vi, United States Office of Education, OE-23052, 1970.